RAILROAD GAZETTE

FRIDAY, JUNE 6.

Contributions.

The American Locomotive that Eames Took to England.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of the 16th of May, you say in regard to locomotive "5,000," built by Messrs. Burnham, Parry, Williams & Co., with a single pair of drivers, for the Philadelphia and Reading Railroad: "The engine was a very interesting experiment; but, though it sometimes made very fast time, and probably can be depended upon to make very fast time with a light train, it could hardly be called a successful experiment. After trial it was not accepted by the company for which it was built."

The above is not correct; the facts are as follows: The Baldwin Locomotive Works had in 1879 a contract with the Philadelphia & Reading Railroad Company, for 30 freight locomotives and one fast passenger locomotive, of which all but two of the freight locomotives and the one passenger locomotive had been delivered when the failure of the Philadelphia & Reading Railroad Company took place in May, 1880. They therefore declined to deliver the two freight locomotives and one passenger locomotive, and they subsequently sold the two freight locomotives to the Wabash, St. Louis & Pacific Railroad Co., and the passenger locomotive to the Eames Vacuum Brake Co. The statement above quoted, that "the engine was not accepted," is incorrect.

Trial trips had been made with this passenger locomotive, but the delivery was not completed, and the locomotive was withdrawn by Messrs. Burnham, Parry, Williams & Co., from the Round Brook line.

This locomotive made the run from Philadelphia to Jersey City in *ninety-eight minutes*, and the return trip in *one hundred minutes*, as per report of Mr. John E. Wootten, General Manager, under date of May 17, 1880.

The writer was also on the train when the above run was made, and his tally agreed with the above. On this trip 2.8 miles were run in *two* minutes, part of which distance was an ascending grade of 16 ft. per mile, being at the rate of *eighty-one miles per hour*. W. BARNET LE VAN.

PHILADELPHIA, May 30, 1884.

The "So-Called Clearing House at Boston."

TO THE EDITOR OF THE RAILROAD GAZETTE:

An individual who for reasons best known to himself prefers to dodge behind the pseudonym of "Car Accountant," rather than come out square-toed over his own signature, has an exceedingly hot article in your issue of May 30, under the heading, "Detentions to Cars, Especially in New England." As I have no means of knowing who the writer is, will you allow me to address him through you?

Mr. Car Accountant, have you ever visited the "so-called Clearing House at Boston" and inspected its workings? If so, you must *know* that your statement is a mass of falsehood and misrepresentation from beginning to end. If you write simply on evidence derived from others, will you allow me to extend to you a very kind invitation to come to Boston and look into the system, so that when you have occasion to write up the subject again, you may know what you are talking about. I shall be pleased to extend to you passes over the roads in this system and I pledge you my word that you shall have every opportunity to see the institution *as it is*. Awaiting your reply I remain,

Respectfully yours,

E B. HILL,

Manager Railway Clearing House.

BOSTON, Mass., June 3, 1884.

[We can assure Mr. Hill that "Car Accountant" has experience in interchanging cars with New England Clearing House roads, and we protest against finding fault with him for writing anonymously. In a very large number of cases railroad officers of the highest character and position feel it improper to write otherwise. It is absolutely unimportant whether it is a railroad president or an office boy that makes the criticisms, if the criticisms are well founded. That is the sole question at issue, concerning which we have ourselves no other information than "Car Accountant" and Mr. Hill have given.—EDITOR RAILROAD GAZETTE]

Railway Invention Bureau.

TO THE EDITOR OF THE RAILROAD GAZETTE:

We feel that your mention of our work in the last number of the *Gazette* does not do us justice; and as your argument in regard to the functions of a judge applies so well to our actual work, you will allow this explanation of our *modus operandi*:

1. All examinations and reports are made by entirely disinterested experts, who are paid in cash by the Bureau for the services they render.

2. We receive no interest in the invention, unless we have been at the expense and labor of procuring a patent at our own risk.

The interest you doubtless had in mind when writing the notice goes to the railway company in consideration of their being at the expense of practical test, and this is only when the owner of the invention desires it.

3. We are willing to act as agents for those, and those only, who have inventions conforming to our standard of merit. In such cases we charge the ordinary agents' commission when sales are made; nothing in the event of our not being able to dispose of it.

4. Thus far in our work, owners of patents attaining the standard of merit have chosen to be their own agents, and as at least nine-tenths of all examined fail, we fail as yet to see where our compensation comes in, except from examination fee. Besides, we have been generous, and remitted fees more frequently than we have received them. We might be and are willing to be the servants of the public, but do not feel justified in paying fifty dollars a day to our examiners out of our own pockets.

I inclose a copy of examiner's blank, from three to four of which are filled independently by as many examiners. We ask nothing but what we merit.

J. F. WILSON, Secretary.

Improved Refrigerator Car.

The drawings shown herewith illustrate the principle of a method of constructing refrigerator cars designed and patented by Messrs. T. N. Ely, General Superintendent of Motive Power of the Pennsylvania Railroad; J. W. Cloud, Engineer of Tests of the same company, and E. B. Wall, Superintendent of Motive Power of the Pittsburgh, Cincinnati & St. Louis Railway, the origin of which was as follows:

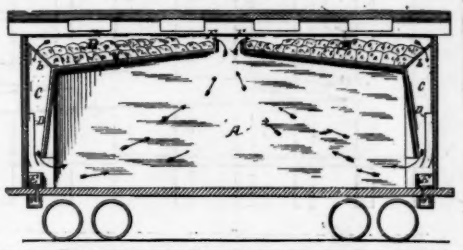


FIG. 1.—REFRIGERATOR CAR, PATENTED BY THEO. N. ELY, JOHN W. CLOUD AND E. B. WALL.

When the Pennsylvania Railroad Co. wished to build refrigerator cars in 1883, it found experimentally that the cars in use did not make a circulation entirely down to the car floor, because of the conflict of currents, there being no established

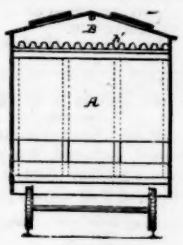


FIG. 2.

course for the circulation to pursue. Thus the effect of the ice in cooling the car was more by conduction than by circulation.

It was thought that this state of affairs was not conducive to purity of air, as it was found that the entire air would circulate over the ice by bringing cold air from the ice chamber to the car floor, cars were built in the form shown by the cut. In these cars the circulation is claimed to be

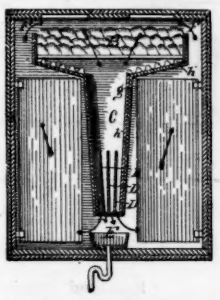


FIG. 3.—STATIONARY REFRIGERATOR, APPLYING THE PRINCIPLE OF THE DEVICE.

very good. The difference in temperature between the bottom of flue in the end of the car near *E*, and the top of the car at the centre near *F*, is about 1 degree Fahr. It is to be presumed that the air is, necessarily, at the dew point corresponding to its temperature when it comes from flue *C*, so that it can absorb no further moisture, but the increase of temperature by 1° before entering ice chamber is sufficient to dry up the car and keep it so, provided, of course, there are no leaks in the ice box, since each degree of temperature adds largely (over 3 per cent.) to the quantity of water which the air can evaporate and hold in suspension. The circulation depends entirely upon the height of flue, other things being the same, just as in a chimney, except that the circulation is down instead of up.

The car is designed to run without the use of salt, and it is believed that its construction enables it to give the lowest temperature that can be had in cars by use of ice only.

The following is a detailed description of the invention, nearly in the words of the patent specifications:

A is the chamber to be cooled.

B is the ice-box, which is situated at the top of the refrigerator.

C is a flue opening at its top into the ice-box *B*, and extending down nearly to the bottom of the chamber.

D, *D*, *D* are metallic plates or diaphragms, placed inside of the flue *C*, and preferably parallel with it, so that as little resistance shall be offered to the descending air as is possible

E is a drip-disb, provided with a trap.

F F are openings at the top of the ice-box for the admission of air.

b b are gratings or bars placed over the entrance to the flue *C*, to prevent ice from falling into it from the ice-box *B*. The walls of the ice-box and flue are made up of an outer skin *g*, of wood, or other poor conductor of heat, and of an inner metallic skin *h*. The bottom of the ice-box *B* is preferably constructed, so that it will slope toward the flue *C*, and its inner metallic skin corrugated, as shown at *h'*.

The interior metal ring *h*, of the ice-box and flues, and the metal diaphragms *D* promote the condensation of the moisture in the air passing through the flues, and constitute suitable surfaces on which it can be deposited. The water runs down from the flue and diaphragms into the drip-pan or trough *E*, and by means of the trap with which it is provided escapes outside of the refrigerator without allowing the admission of any air. It is evident that the form and number of the diaphragms *D* may be varied at will, the only limitations on their manner of construction being that they shall present a sufficiently large surface upon which the water may condense, and be so arranged in the flue *C* as not to materially interfere with or check the descending current of air. The corrugations *h'* of the bottom of the ice-box conduct the water from the melting ice direct to the flue *C*, and deliver it in a thin even stream. The bottom and outside, *g*, of the ice-box and flue being of wood, there will be no tendency for the water to deposit upon them, and the current through the chamber will be a drying as well as a cooling one.

Where the ice has a tendency to pack in the ice-box a grating or slatted box is placed in the ice-chamber, so that the air may circulate under or alongside of the ice without passing through it, as in Fig. 3. The same difficulty is overcome in Figs. 1 and 2 by placing bars or gratings *b b* over the mouth of the flue *C* in such a way that they shall project upward to or even above the level of the ice in the box. Their upward slant from the edge of the flue serves at the same time to keep the ice from falling into the flue, and enables the air after passing over the ice to find its way down into the flue without passing through the ice. Provisions of this kind to insure an uninterrupted current of air are deemed of the utmost importance, as if the mouth of the flue *C* becomes choked with ice the cooling of the chamber will be very imperfect, and the moisture will condense in the chamber and on its contents.

Where it is practicable it is preferred to construct the flue *C* in the center of the chamber to be cooled, and provide entrances for the air all around the top of the ice-box, as the construction securing the most perfect circulation of the cooled air. Fig. 3 is intended to illustrate such an arrangement, and shows how, in a refrigerator with two side doors, the flue would be placed; its central position offering no obstacle to getting at any part of the interior of the chamber.

"A Standard Freight Car Truck."

The monthly meeting of the New England Railroad Club was held Wednesday, May 28, President F. D. Adams in the chair. Notwithstanding the heavy storm, there were 45 persons present. The committee on transportation to the Master Builders' Convention at Saratoga, appointed at the last meeting, reported that suitable arrangements had been made for special cars over the Boston & Albany and Fitchburg Railroads, to and from Saratoga.

On motion of Mr. J. N. Lauder, five members were added to the Executive Committee, and a Committee on Finance was appointed.

The matter of presenting a constitution and by-laws was referred to the Executive Committee. The question for discussion was then taken up:

Is a standard freight car truck possible, and if so what are the features in detail of the best design, as to style, size of iron and bolts, kind of springs, journal bearings, etc.

The following resolutions were read, one by one, by the President and discussed:

"*Resolved*, That for the sake of a uniform standard freight-car truck we will recommend the adoption of either a swing or rigid bolster truck, as the majority of the members of the Master Car-Builder's Association by ballot or otherwise shall elect."

Mr. Adams showed a drawing of a truck which he had made, comprising some of the features of the suspension truck, but with a continuous frame.

Mr. Lauder believed in a swing-bolster truck, but would adopt a rigid bolster if the Master Car-Builders' Association should select that kind of a truck for a standard. He thought, however, that it might be advisable to adopt two standards, one a swing and the other a rigid-bolster truck.

Mr. Chamberlain, of the Boston & Albany, favored the Thielsen truck with the top arch-bar made into a continuous frame to strengthen and keep the truck square, and to give something from which to hang the outside brakes.

Mr. W. E. Chamberlain, Superintendent of the Providence & Worcester Railroad, and several others, would adopt either a swing or rigid bolster, according to the action of the Master Car-Builders' Association.

Mr. Adams spoke of some of the advantages of the suspension truck, mainly ease of motion and the prevention of end wear on brasses, etc. After quite a long discussion the resolution was unanimously adopted.

The second resolution was as follows:

"*Resolved*, That the Fletcher spring-box cover, in consideration of its general preference by car-builders, and the members of this Club, may be considered the best now in use. We would therefore recommend and urge its adoption as one of the features of a standard truck."

Mr. W. E. Chamberlain moved that the resolution be adopted without debate, as he thought no one could consistently oppose; and it was so adopted.

The third resolution was:

"*Resolved*, That it is advisable to adopt the present Master

Car-Builders' standard axle and oil-box in the railroad trucks, providing the load is not increased beyond 20 tons."

Mr. Marden did not believe that the Master Car Builders' axle was heavy enough for a 20-ton load. His company had already increased the size of its axles in the centre.

Mr. W. E. Chamberlain could see no difficulty about changing the dimension of the centre of the axle, as that would not interfere with its interchangeable character. The wheel-seats, journal and length were the parts which could not be changed, and he thought the side strong enough.

The third resolution was then unanimously adopted, and the fourth was brought up, as follows:

"*Resolved*, That it is not advisable to increase the capacity of ordinary merchandise cars beyond 20-ton loads."

Mr. W. E. Chamberlain asked, "Why not?"

Mr. Lauder supposed a convention of superintendents and freight agents would advocate heavier loads as being more economically handled, while mechanics generally, having in mind the difficulties in construction, disapprove the increase in load; but he was inclined to think that they can carry more than 20 tons with the present axle properly strengthened in the centre.

Mr. Marden, if ordered to build cars of greater capacity certainly would do so if he could; but he thought there would be a reaction in this matter of heavier loads. Cars at the present time marked 15 or 20 tons do not prove strong enough for these loads. The question now seems to be to get greater speed and carry lighter loads. Iron-frame cars will undoubtedly be used.

Mr. Lauder favored, on the whole, the heavy loads, as saving more in other operating expenses than they increased car repairs. He thought through cars now average 15 tons of loads.

Mr. Fletcher, Superintendent of the National Despatch Line, said that their cars would average 16 tons load.

Mr. W. E. Chamberlain said it seemed plain that the greater the capacity up to an economic limit the less the expense and the lighter the investment. Many commodities can be easily carried in heavy loads, and without much bulk.

Mr. F. D. Adams understood the resolution to refer to merchandise cars, and taking these cars from Chicago to Boston, he thought that a capacity of 20 tons should be the extreme limit. If he understood his Superintendent aright the average load had not been over 7 tons. What in the name of reason did they want of a car that will carry 30 tons when they can get only 7 as an average load? He could readily see that if they had cars of suitable capacity and could get loads of 20 or 30 tons, that the expense of transportation would be less with heavy than with light loads, other things being equal. Guns were carried during the war weighing some 80,000 lbs. without any serious difficulty. The M. C. B. axle would carry 25 tons without difficulty.

Mr. W. E. Chamberlain, advocated greater capacity for freight cars as being economy in the operation of railroads, and believed they should have to come to it.

The fourth resolution was then adopted by a rising vote of 6 to 4.

The fifth resolution was:

"*Resolved*, That in the experience of the members of this Club the Car Site brake-shoe and head is the most economical and desirable now in use, and that it should be one of the features of the standard truck."

Mr. J. N. Lauder favored the solid brake-shoe. The Old Colony Railroad had about 100 kinds of brake-shoes of various forms, and no two alike. He had examined Mr. George Westinghouse's brake shoe, and was convinced that there is merit in it. It provides for a solid brake-shoe. He proposed to build a few cars with this shoe. It is said there is more waste in the solid head, but he has doubted it. He would hang brakes inside the wheels. A full description of Mr. Westinghouse's brake could be found in the *Railroad Gazette* of November 9, 1883. . . . He thought it would pay any one to make the suoject a study.

Mr. Adams said that some years ago Mr. W. E. Chamberlain worked this brake-shoe matter up, and the Christie brake shoe and head were adopted by the Boston & Albany, and Mr. Adams thought there had been a good deal of money saved by its use. If the old-fashioned solid head is best his road have been making a mistake all that time.

The resolution was then adopted unanimously.

The sixth resolution was:

"*Resolved*, That it is best to hang brakes to the truck outside the wheel to a continuous frame."

Messrs. Richardson and Adams favored outside brakes, but would give in to the majority.

Mr. Lauder did not believe they ought to build a truck that had anything outside the wheels to hang the brakes to. The Thielsen truck, as he had built it, he thought would keep square. If the truck can be kept square this continuous frame would add to the expense. Mr. Adams asked what does the Thielsen truck cost. He had an idea it was an expensive truck.

Mr. Lauder said its cost was perhaps a little over $300 when he built them, several years ago, when things were higher than now. He did not think it an expensive truck. With all due regard to Mr. Garey's opinion, he could not see how his plan helped to keep the truck square. He could not indorse the resolutions, as there was no place on his truck to hang outside brakes. He knew there was some difficulty in inspecting an inside brake. The short connection must be heavy on the inside brake or it would bend; the levers run nearer the track, and are perhaps more exposed to accident.

Mr. Adams asked if Mr. Lauder would object to a continuous frame if it did not cost any more.

Mr. Lauder did not know that he would.

Mr. Adams said that when the question of adopting a truck for the New York Central Railroad came up, the Boston & Albany truck was under consideration, and came very near being adopted. He understood that Mr. Garey was strongly in favor of it at that time. Mr. Adams was strongly prejudiced against it when he went to the Boston & Albany, but he now believes it to be a good truck and approves it.

Mr. Chamberlain thought that if they should adopt the Thielsen and run the toparch bar around, on which to hang the brakes, the expense would be less than to hang them inside.

To Mr. Lauder it seemed that if the bar was carried around it would be expensive, and he asked why a wooden bar should not be used.

Mr. Chamberlain objected to a wooden bar as it shrinks and makes trouble.

Mr. Lauder agreed that it would shrink and perhaps had better not be used, but the continuous bar was expensive to make. Seven-eighths of the brakes are hung to the body of the car. He admitted that it is not a good mechanical device, but saw no good reason why brakes cannot be hung between the wheels.

Mr. Adams objected to that. He makes frames by the hundred and the cost was less than ¼ cent per pound for forging. The labor does not amount to anything. He thought the continuous bar an important feature. In the common kinds of diamond trucks the bolts get slack and the truck will get out of square.

After considerable spirited discussion, the resolution was adopted, with but one vote in the negative.

The seventh resolution was:

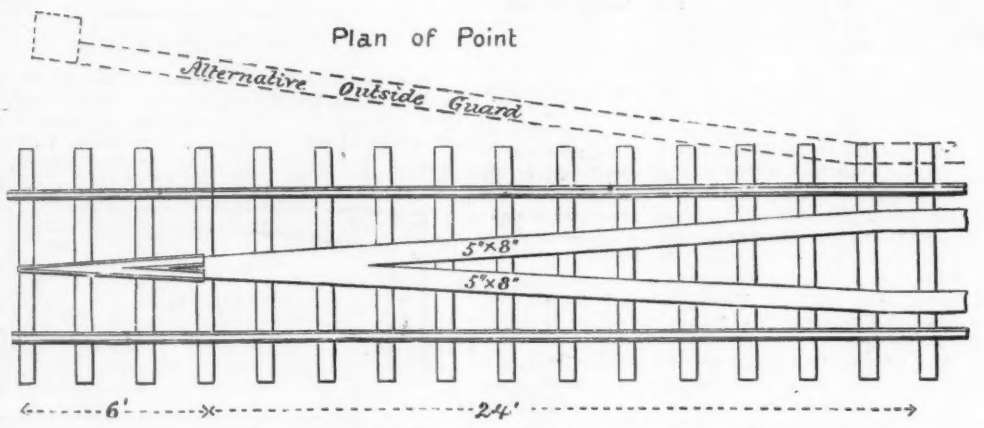
7. "*Resolved:* That we will adopt any plan for hanging brakes which a majority of the members of the Master Car-Builders' Association by ballot or otherwise shall decide as preferable."

Adopted unanimously.

Resolutions as follows were considered and approved by the Executive Committee, but owing to the lateness of the hour in reaching them they were not acted upon by the Club.

8. "*Resolved:* That in our judgment and from observation and experience we believe, and we do so recommend, that the arch bars to the diamond truck should be of the following dimensions: Top, 3½ × 1⅝; bottom or inverted arch-bar, 3½ × 1 in., and that the pedestal tie-bar be 3½ × ⅝; and if a diamond truck is selected as a standard, we urge the adoption of these sizes in said truck."

9. "*Resolved*, That if a diamond truck be adopted, one feature of that truck should be a continuous frame, 3½ × 1 in., to strengthen the truck and keep it perfectly square."



Proposed Standard Bridge Floor. Designed by Mr. W. Howard White.

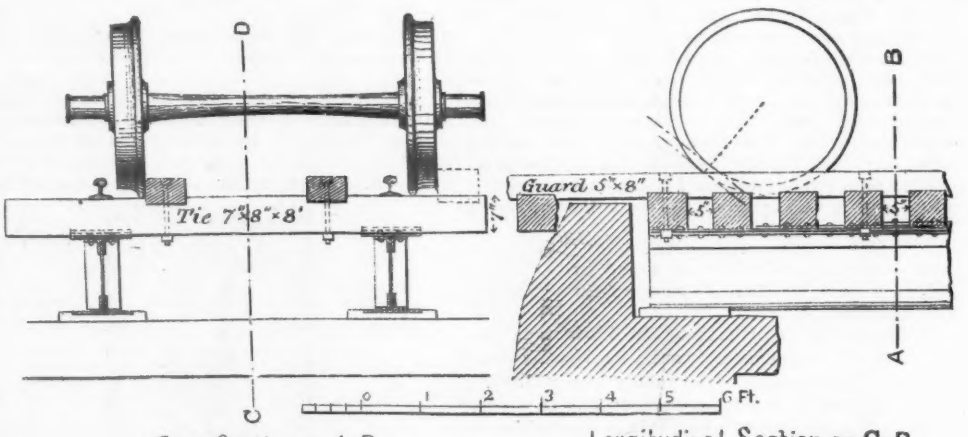
10. "*Resolved*, That it is the opinion of the members of this Club that the standard trucks should have a 5 ft. wheel-base, and we so recommend."

11. "*Resolved*, That if a committee or commission shall be appointed by the Master Car-Builders' Association to fix upon a standard freight car truck, they be authorized to furnish each company agreeing to the standard with a set of iron patterns at the expense of said company, and that the patterns must be made by a railroad pattern-maker who thoroughly understands this kind of work, thereby securing the most perfect workmanship."

Adjourned to the fourth Wednesday in September (Sept. 24).

Proposed Standard Bridge Floors.

Mr. W. Howard White, Chief Engineer of the Chicago, Burlington & Quincy Railroad, has recently presented a paper to the American Society of Civil Engineers, in which he advocates the form of floor shown in the accompanying engravings, the leading feature of which, and the one on which Mr. White especially insists, is the use of inside instead of outside guard-rails. Mr. White claims that the floor is suitable for all forms of bridges except those where the ties can rest directly on the flange of girder bridges. He proposes 7 × 8 in. oak ties, 5 in. apart, fitted down over the rivet heads. On wooden stringers he proposes to gain the tie ¾ in. over the stringer in preference to using line spike. He sees no reason for using a tie over 8 ft. long. On double track bridges he thinks it "undoubtedly better" to run the ties clear across, although this is disputed on the ground of the difficulty and cost of renewals in case of breakage or other injury to the ties.



Proposed Standard Bridge Floor. Designed by Mr. W. Howard White.

Mr. White continues:

I am strongly in favor of an inside guard, for the following reasons:

1st. It is more efficient for the same height above the tie than the outside guard, and its limiting height (that of the rail) is more efficient than such heights of outside guard as are ordinarily used.

2d. It can be placed so as to hold the wheel nearer the rail than an outside guard of equal efficiency can be, having regard to snow plows.

3d. It is more readily and strongly secured at the ends for the purpose of drawing the derailed wheels over to the rail, and to secure the ditching of a car that has got off too far to be safely drawn in without danger to the trusses of a through bridge.

4th. It is more economical than any other guard to secure the above objects.

Its greater efficiency is due to its taking a bearing on the flange side instead of the tread side of the wheel, taking in a larger arc of the wheel at the same height, and meeting a rounded edge with a tendency to shear off, instead of a sharp edge with a tendency to cut in.

With an ordinary 33-in. wheel with 1⅝ in. flange, the advantage on account of the larger arc and consequently higher climbing tangent, as shown by the diagram, makes an inside guard 4 in. high equal to an outside guard 1¼ in. higher; and this advantage increases for larger wheels and deeper flanges. The advantage due to the meeting with the rounded edge is difficult to estimate, but it can hardly be less than ¾ in., viz., an inside guard of 4 in. height is equal to an outside one of 6 in. for a 33-in. wheel.

As to the second point, efficiency in drawing a derailed wheel close up to the rail, in general it is necessary on account of snow-plows to place a guard higher than the rail some considerable distance outside of it, and since the inside guard is more efficient for the same height, the second point may be considered proved.

As to third point, it is evident that the inside guards can be brought together, making a strong point, and fastened to the ordinary track ties, while the flare of the outside guards has to be set up independent of the ordinary track structure.

In regard to wheels too far off to be caught and restored to line by inside guards, I would observe that, while it is the practice of some roads to attempt this restoration, it does not seem to be a wise one. Wheels so far off will generally be at such an angle as to make their restoration almost impossible, and if the attempt is unsuccessful, in the case of a through bridge, it would in all probability be destroyed, since no practical bunter-post that could be put up would arrest with any certainty a car or train at considerable speed.

For this reason it appears to me better to extend the inside guard far enough beyond the bridge—say, with the point at twice the length of the inclined portion of the truss end—to throw the car if it took the wrong side of the point clear of the bridge structure.

In case of a high embankment, it would be desirable to carry it still further to a point where ditching would not be too serious an accident.

* * * *

As to the material for inside guards, the use of old rails, as sometimes practiced, appears too expensive for application to all bridges, besides not serving the purpose of keeping the ties properly spaced; and I have, therefore, in the diagrams appended, used a 5-in. × 8-in. pine stick (this would be increased to 6-in. × 8-in. for 4½-in. and 5-in. rail) notched down 1 in. over the ties and bolted to every third tie with a ¾-in. bolt. This construction then serves the triple purpose of guard rail; of keeping the ties properly spaced, and from creeping, by its connection with the ordinary track ties on the bank end, and of lifting the superstructure by means of a jack or lever for the purpose of removing ties.

The ends of these sticks I have shown brought together in a straight point 30 ft. long, which gives an angle only 2.4 times as great as 20-ft. switch rail with 5-in. throw, terminated by a rail point 6 ft. long.

* * * *

There may be some question as to the expediency of using timber in the point, but my impression is that it will be found sufficient, when in good order, to turn a wheel, and as often as it is marked by a derailment or becomes rotten it can be replaced at less capital cost than the iron.

I would note that the Lake Shore & Michigan Railway uses, or did use some years ago, a bridge floor similar to the

one advocated here in size of tie, spacing, and notching of tie over stringer and guard timber over tie, but it uses a 13-ft. tie, rails for inside guards curved to a point, and a 7-in. × 8-in. outside guard.

This design appears defective in two ways: first, that no provision is made by extending the ties after the point of the inside guard has been passed to carry the outside derailed wheel to the bridge in case the other wheel takes the wrong side of the point; and secondly, there is not room enough on even these long ties to carry the outside wheel in the position it must take on the bridge when the other wheel has taken the wrong side of the point.

It is evident that if inside guards brought to a point are used, there is no middle course between ditching a train if it takes the wrong side of the point, and the provision of ties long enough, that is, 15 ft., with a stringer under their ends to carry the wheels, in the above contingency.

So far as through bridges are concerned, I think the floor I advocate is the safest possible at any resonable expense, and in claiming that any more perfect floor is needed for other classes of bridge, it is well to consider how small the chances of accidents are for which we are providing at so much extra expense at the increase of the ties to 15 ft. in length, and extra stringers under their ends, entails.

I doubt if the experience of all the railroad men in the country would show more than two or three cases where, if inside guards had been used, as proposed, any further precaution would have been of advantage even to freight trains.

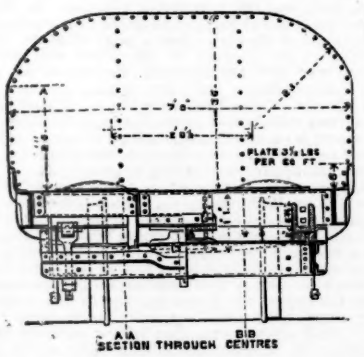
The chance of this is as follows:

1st. The comparatively large chance of derailment.

2d. Out of this the far smaller chance of a derailed wheel going more than half gauge distance from the rail. One out of five would, I think, be a high estimate.

3d. That it shall include a bridge in the run of a train while derailed. Two bridges in a mile would be rather a high average; and as the derailments would average a third of a mile in extent, possibly a half, it is about an even chance that a derailment shall cover a bridge.

4th. That it shall be a passenger train, say, 1 in 3, and we have 1 in 30, and if we further throw out derailments covering through bridges, which I have shown cannot be helped by wide floors, and bear in mind that passenger derailments are much shorter in extent, and that the connection between the cars is much more close and perfect, probably not one derailment in one hundred will be of a passenger train covering a bridge and having the wheels more than half gauge away from the rails.



I leave freight trains out of account, for I think the chance of 1 in 10 would lead any railroad man to ditch a freight in that proportion of derailments rather than incur the expense of providing for it at all bridges.

In conclusion, I would note, as a corollary to this discussion, that the treatment of derailments gives an argument for avoiding middle trusses on double-track bridges, which may serve to turn the scale in favor of two trusses only in some cases.

Successful experiments have been made by Mr. McClure, Chief Engineer of the Chicago, Burlington & Quincy Railroad system, with a rerailing arrangement at the ends of bridges, and it is possible that this will be substituted for the simple drawing together of the guard timbers, but it does not conflict with the other points above advocated.

Iron Freight Cars for the Indian State Railways.

The Indian Government has recently advertised for contracts for 1,000 "bogie wagons," 25 ft. long, with 28 in. wheels, of the design shown in the four cuts herewith. The weight is not given in the specifications, but the dimensions are very fully given in the engravings, and the following extracts from the specifications will give an idea of the mode of construction which, if really essential for the construction of iron cars will, it may safely be asserted, prevent the extended use of such cars in America for some time to come.

The intention of this contract is that every piece of iron shall be manufactured with such accuracy that any piece may be used without dressing of any kind in the place for which it is designed in any of the wagons. To insure this, every piece must be made from a carefully-prepared metal template or gauge, and all holes in it, whether hereafter specially mentioned or not, must be drilled. It must further be drilled through the holes in the template, so that the corresponding parts of all the wagons may, without doubt, be exact duplicates of each other. The floor, middle bar, headstock and bogie end and cover plates may be punched, provided that all the holes in each plate are punched simultaneously, or through a template clamped and fixed to the plate which contains all the holes in the plate. The spring-hanger brackets are to be forged out of the solid angles and also the spring-hangers and the holes through them are to be drilled and the pins turned. The buffer heads may be dabbed on to the jaws under a steam hammer, but great care must be taken to secure a thoroughly sound weld. The buffer faces must be faced up all over in the lathe. The buffer shanks must be forged solid with the jaws without a weld in their length, and must be drawn down under a steam hammer true to the form shown, and the round part must be turned. The coupling hooks, slide blocks, yokes, connecting-rods, screws and nuts, buffer spring sockets and buffer stop-plates must be forged out of the solid, and the holes for the pins through the buffer jaws and hooks must be drilled, and the pins must be turned. The screw, nut, side-rod, yoke, slide block and pins connected with them may be left black, if sufficiently neat and clean forgings. The joints and pins are to be made an easy fit, and if not forged clean and true they must be turned, bored, or planed on the parts tinted red on the drawing. The spring sockets and the draw and buffer-spring plates must be dressed off perfectly true to the dimensions given, and faced and turned inside. The knees and joint irons connecting the channel bars, etc., forming the underframe or bogie trucks may be made out of angle or channel iron, as the case may be, but the edges of the knees and joint irons must be neatly dressed off, and the holes through them drilled. The towing irons and cord hooks are to be forged out of the solid. Holes to get out the centre pins are to be made in the floor plates and provided with ⅛ in. thick plate covers, each secured by bolts ⅛ in. diameter. The central bearing plates of the bogie must be of cast-iron, bored and turned. The pin through them is to be of wrought-iron and must be turned; the side bearings are to be of cast-iron and must be ored, turned and planed so as to make good machine work.

That the average number of ties used per mile of road is 2,640; the size, 6 in. × 8 in. and 8 ft. long; average durability, seven years, and the average cost 35 cents.

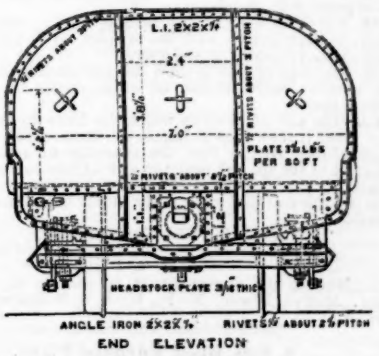
The kinds of timber most in use and their durability are as follows:

	Endurance.	Cost.	Cost per year.
Oak	7 years.	37 cts.	5.25 cts.
Long-leaf yellow pine	6.5 "	37 "	5.60 "
Chestnut	7.3 "	42½ "	5.82 "
White pine	6.6 "	31½ "	4.75 "
Hemlock	5.4 "	25 "	4.64 "
Cedar	9.8 "	36 "	3.67 "
Tamarack	7.2 "	27 "	3.75 "
Cypress	8.7 "	39.4 "	4.51 "
Redwood	11.2 "	40 "	3.57 "

Of course the expense per tie yearly does not take into consideration the expense of replacing oftener those of the least durability. Nor is there any record of the yellow locust, it being but little used, its value being overlooked, I think, for use as railroad ties—its long durability, lasting more than twice as long as any other wood, hardness to resist wear, and the good quality of holding the spikes firmly. From these tables he gathers the fact that the cost per mile of single-track road is $924 for ties, and if renewed each seven years, $132 yearly, and in the United States $14,784,000. The yearly expense of $132 is the same for sidings and branch lines of but little importance as for the main lines, they being subject to decay before being worn out.

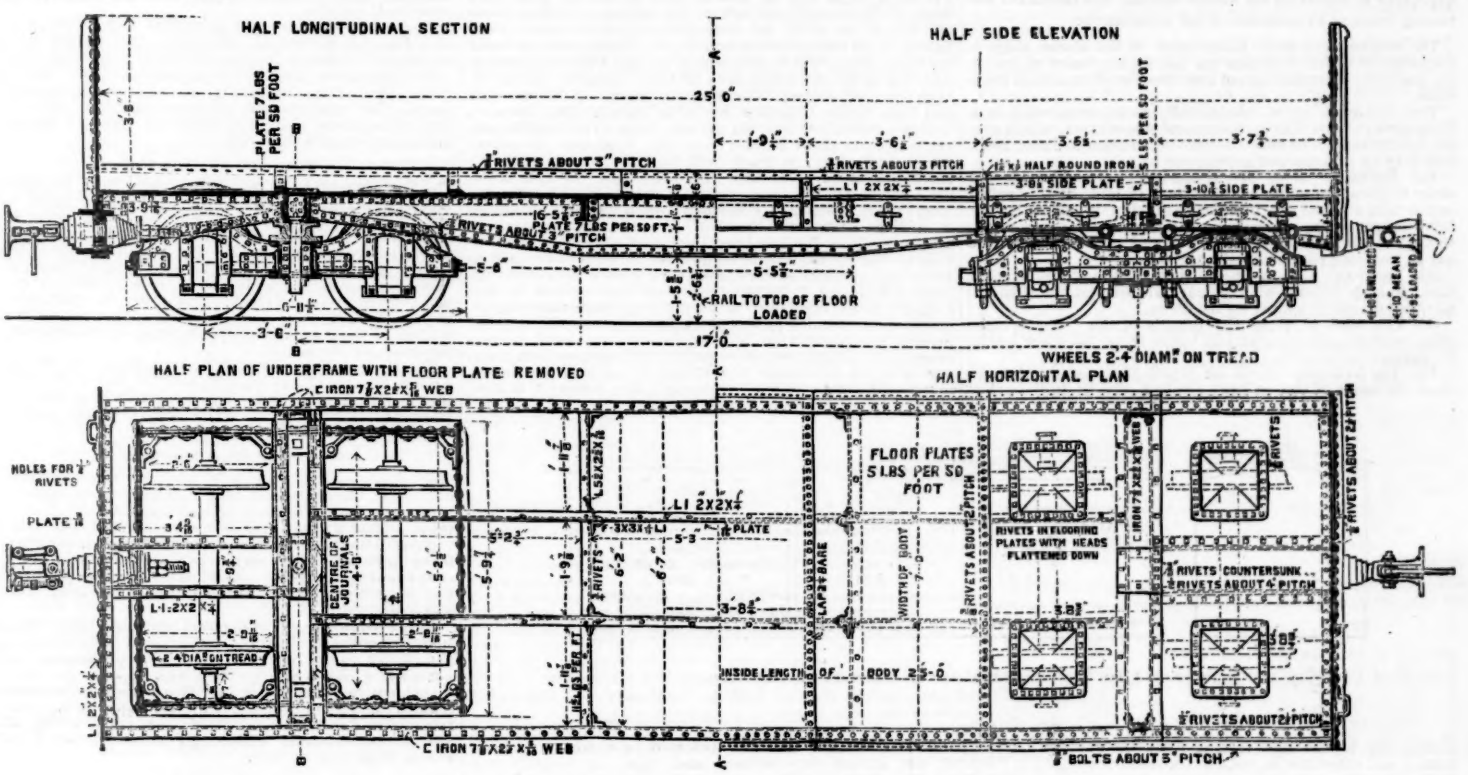
The reports gather the facts that the average number cut from an acre is 100, and the average number of years required to grow timber large enough to cut ties is 30. This would require 12,672,000 acres of woodland in constant growth. We can compare this with the estimated number of acres of woodland growth in the United States, namely, 190,255,000. In other words, it requires 113.3 acres of timber growth for each mile of single-track road, or a strip over 400 feet wide by the side of each mile of track,* and when double track, a proportionately larger amount; and with this thought must be taken into consideration that in a very large part of the country it is impossible to cultivate timber.

In connection with all this, we must notice that our railroad system is far from being complete. Not only in new countries, but in the oldest settled portions are new lines constantly needed, being built, and extended: also that the ties are but a portion of the timber used by railroad companies—fences, bridges, cars and telegraph poles take nearly if not quite as much more for constant use.



Thus we see the actual facts. Can our country supply the wants? On many roads, the long distance that ties must be hauled will increase the cost to double the amount now estimated, and finally the supply must end, if not replanted by individuals or by the railroad companies.

The advantage the railroad companies have for planting are that they have many places where tree growth would give the roads protection from snow drifts and wind storms. Many waste places along the lines of all roads are suited for



IRON "BOGIE-WAGONS" FOR THE INDIAN STATE RAILWAYS.

Tree Planting by Railroad Companies.

[A paper by John S. Hicks, of New York. Read at a general meeting of the American Forestry Congress, Washington, D. C., May 8, 1884.]

That railroad companies should plant trees and encourage tree planting is plainly shown by the following tables.

By the latest accounts there are nearly 113,000* miles of railroad in the United States.

The Forestry Department has prepared, under the able supervision of Dr. Hough, an elaborate report from companies representing 70,889 miles of these roads, and these reports, being so varied in their character and from so many different sections of our country, he gets the following facts.

* At the end of 1883 over 120,000 miles of road and about 148,000 miles of track.—EDITOR.

* "Over 400 ft." truly; 400 ft. = 24¼ rods, and as a strip a rod wide and 1 mile (= 320 rods) wide is two acres, a strip 400 ft. wide would be but 48½ acres; and to make 113.3 acres per mile we shall have to widen the strip to 56⅔ rods = 935 ft.—EDITOR.

nothing but tree growth. Many companies own large grants of lands only fitted for forest growths which will find no purchasers. These could all be planted. I think I can safely say that there is but little land that would not grow timber of some kinds to an advantage.

Forestry culture will teach the best kinds for each locality. In sandy and dry soils the yellow locust would grow; in still more barren soils the ailanthus. Both of these trees attain a growth just suited for railroad ties and fence posts. The larch would do in higher attitudes.

The question is of so great an importance that the railroads of the United States should not for a moment delay action, and when once a system of supply is established, it is so simple that it will remedy all uncertainty as to the future; and think, thirty years must pass before the average tree now planted is suited for cutting ties to advantage.

Proposed System of Lettering and Numbering Line Cars.

The Committee of the Master Car Builders' Association appointed to report on the above subject has issued the following circular to members of the Association:

The undersigned, your Committee on the above subject, respectfully solicit criticism on the arrangement of lettering line cars, described herein and illustrated by sketch herewith.

The arrangement is substantially as recommended by a Committee of the Car Accountants' Association, which presented the subject to your Chicago convention in June, 1883, and may be summarized as follows:

1st. The half of sides of car on which the doors do not slide to show the name of the "fast freight line" (spelled out in full) and the car number immediately below it; the light weight of the car, with date and place of last weighing, to appear within two feet of the sill and near the end of the car in the same panel with the above.

2d. The doors to show the initials of the "fast freight line," in large letters, with the car number just below them; no other marks to appear on the doors.

3d. The ends to show the initials of the "fast freight line," with the car number just below them; no other marks to appear on the ends.

4th. The half sides of car on which the doors do slide to show the name of the railway (spelled out in full) contributing car to the fast freight line; the names of cities, routes, and other marks, such as trade-mark devices, symbol of the line, etc, to be put under the name of the railroad; the capacity of the car to appear within two feet of the sill and near the end of the car and in same panel.

System of Lettering and Numbering Line Cars, submitted for Criticism to the Members of the Master Car-Builders' Association.

Record of "fast freight line" cars is always kept under the name of the fast freight line, and not under the several names of the railway companies contributing cars to the line; it is for this reason that the Car Accountants' Association advise collecting into one panel that information which is essential for the correct reporting of line cars by conductors, agents and others.

Your Committee suggests that it would be advisable that the name of the owning railway (in panel over which the door does slide) should be followed by the owner's number. This information would facilitate effecting settlements for line cars destroyed, also making charges for renewal of wheels and axles.

It is suggested that you should consult with the Car-Accountant of your road in criticizing this proposed system, and that modification of the same should be noted in the skeleton diagram, which is given for that purpose on sketch herewith.

The Car-Accountants' Association Committee also submit a system of lettering all other box cars (not in fast freight line service) as follows:

1st. The half sides of car on which doors do not slide to show the name of the railroad company (spelled out in full), with the car number immediately below it; the light weight of the car, with date and place of last weighing, to appear within two feet of the sill and near the end of the car in same panel with the above.

2d. The doors to show the initials of the railroad company, in large letters, with the car number below them; no other mark to appear on the doors.

3d. The ends of cars to show the initials of railroad, with car number below them; no other marks to appear on ends of cars.

4th. The half of sides on which the doors do slide to show any other marks, such as names of cities, routes, etc., or the name of local freight line; the capacity to appear within two feet of the sill and near the end of the car in the same panel.

It is requested that your reply should be made as early as possible.

R. H. SOULE,
L. GAREY,
L. PACKARD,
} Committee.

Answers to the above should be sent to R. H. Soule, Supt. Motive Power, N. Y., W. S. & B. Railway, Frankfort, N. Y.

A New Blast Furnace Plant.

Our correspondent in Chattanooga sends us some particulars concerning the blast furnace plant about to be erected at Dayton, Tenn. The property of the Dayton Coal & Iron Co., the name by which this company is to be known, is situated 38 miles north of Chattanooga, on the line of the Cincinnati Southern Railroad, and comprises some 26,000 acres of coal and iron lands. It was purchased by Sir Titus Salt, of Saltaire, England, and associates, about six years ago. Soon after its purchase the owners commenced a thorough development of its resources by opening its ore and coal deposits, erecting coke ovens, etc. The principal coal seam discovered is about 4 ft. thick, runs through the property several miles, and upon being thoroughly tested has proved to be a very superior coking coal, equal to, if not better than, the celebrated Connellsville coke. This fact has been ascertained by its use for nearly three years in the different furnaces in the Chattanooga district. Besides the red hematite ore upon their property, the company have purchased large deposits in different parts of the district, comprising nearly every variety found in the state, thus giving the great advantage of a large assortment of ores. The ground for the plant, the details of which are as follows, has been already broken: There are to be two blast furnaces 70 ft. high and 20 ft. diameter at boshes. Six Whitwell stoves, 21 ft. diameter by 60 ft. high, will be used to heat the blast. The draft stack for the stoves has a flue 8 ft. in diameter and 160 ft. in height. There will be 24 boilers, 46 in. in diameter and 34 ft. long each, fitted with two 16-in. flues, the boilers to be made of steel of 50,000 pounds tensile strength. The draft stacks for the boilers will consist of two chimneys, 125 ft. high and 8 ft. in diameter. The blowing engines will be five in number, the steam cylinders 36 in. in diameter and the blowing cylinder 84 in. in diameter, with 60-in. stroke, of Witherow's and Stevenson's new pattern. The weight of these engines will be 83 tons when completed. The boilers will be fed by three duplex Worthington pumps, 20-in. steam cylinder and 14-in. water cylinder, with 12-in. stroke, which force the water through five heaters, 36 in. in diameter and 10 ft. high. The stock-house will be 500 ft. long by 200 ft. wide, with three tracks running through it. The engine and boiler house will be 130 by 40 ft., the casting-house 160 by 120 ft., both having roofs supported on iron trusses. The supply of water for these works will be taken from a large freestone spring, and will be thrown into a tank 30 ft. in diameter and 32 ft. high by three duplex Worthington pumps of 12-in. steam and 7-in. water cylinders by 10-in. stroke. The furnaces will be located 300 ft. from the line of the Cincinnati Southern track and about 2 miles from the Tennessee River, to which a broad-gauge track will be laid, which will give access also to the river ores. In developing the coal mines the company has laid about 5 miles of broad-gauge steel track, which, combined with about 2 miles of siding that will be laid at once, will give them ample facilities for handling their raw material. The details of the specifications require the furnace to be built on the most approved pattern, and there is little doubt that the plant will be one of the most complete ever erected in this country, as the company is very strong financially and includes men of much practical experience. In selecting the present time, when iron is so extremely depressed, for the erection of such an extensive plant—the capacity being estimated at not less than 70,000 tons of pig iron per year—many will question their judgment. But when it is considered that the bottom price of pig iron is nearly, if not absolutely, reached, and that the works can now be erected for 75 per cent. of what they would have cost at any time within recent years, or in all probability would cost a year or more hence, it will be acknowledged that the promoters have good reason to believe in the success of their enterprise. Since pig iron is an article of such necessity, these works, so favorably situated, will be able to run when those in less-favored locations, as regards ore and coal, will be obliged to stop. In fact, the continuance of a number of the furnaces in the United States must soon resolve itself into a question of the survival of the fittest.—*Iron Age.*

Transportation in Congress.

In the House on May 31st:

Bills were passed granting the right of way through the Indian Territory to the Gulf, Colorado & Santa Fe and the Southern Kansas companies.

In the Senate on June 3d:

The bill granting a right of way 100 ft. wide through Fort Selden military reservation to the Rio Grande, Mexico & Pacific Railroad Co. was passed.

The House bill authorizing the construction of bridges across the Missouri River at Leavenworth, Kan., and near the town of Rulo, Richardson County, Neb., was passed.

TECHNICAL.

Locomotive Building.

The Meadville shops of the New York, Pennsylvania & Ohio road are building three Mogul freight engines for the road. They have 18 by 24-inch cylinders and the boilers are 51-inch diameter of barrel and have 175 2-in. flues. 11 ft. long.

The Brooks Locomotive Works in Dunkirk, N. Y., are building a locomotive for the Chicago Locomotive Improvement Co. The engine is an ordinary 8 wheel engine with 17 by 24 in. cylinders and 5 ft. driving wheels, its peculiarity being that it is furnished with a Coventry boiler. This is a return-flue boiler modeled somewhat on the return-flue boiler extensively used in marine practice.

The Cleveland, Columbus, Cincinnati & Indianapolis shops in Cleveland, O., are building three new standard Mogul freight locomotives for the road. They will have 18 by 24 in. cylinders and 56 in. driving wheels.

The Mason Machine works in Taunton, Mass., have just completed a heavy passenger engine for the Boston & Providence road. It has 18 by 24-in. cylinders, and the driving wheels are 5 ft. 9 in. in diameter. The engine and tender trucks have paper wheels. It will run on the fast Shore Line express trains.

Car Notes.

The Jackson & Sharp Co. in Wilmington, Del., recently completed several passenger cars for the Cape Fear & Yadkin Valley Railroad. These cars are modeled on the Pennsylvania Railroad standard passenger cars.

Contracts for furnishing all the car wheels required by the Missouri Pacific and its leased lines for one year from April 1, 1884, have been let to the Missouri Car & Foundry Co., of St. Louis, and to the Bass Foundry & Machine Works, of Fort Wayne, Ind. The estimate is about 2,500 wheels per month.

Bridge Notes.

R. F. Hawkins, in Springfield, Mass., is building an iron truss bridge 175 ft. span across a stream near Becket, Mass., on the Boston & Albany road.

The Keystone Bridge Co., of Pittsburgh, has taken a contract for two iron highway bridges in Blair County, Pa., one of three spans and another of one span.

Iron Notes.

There will be no strike or lockout in the iron mills of Pittsburgh this month. The action of the manufacturers of the Youngstown District in deciding to sign the scale of wages as presented by the Amalgamated Association committee decided the Pittsburgh Manufacturers' committee, and on May 30 another conference was held between the Manufacturers' committee and the President of the Amalgamated Association, which resulted in signing the old scale of wages, both sides withdrawing the demands which had been made for changes. Work will therefore be continued without any trouble on the score of wages.

Citico Furnace in Chattanooga, Tenn., is running very successfully, making about 100 tons of pig-iron a day.

Isabella Furnace, in Barneston, Chester Co., Pa., has gone into blast again and is working well.

Springfield Furnace in Blair Co., Pa., is now making about ten tons a day of excellent charcoal iron.

The South Tredegar Iron Works in Chattanooga, Tenn., have shut down for a few weeks. They will probably resume next month.

A new blast furnace will be built at Colebrook, Lebanon Co., Pa., by Robert H. Coleman. It will take the place of the old Colebrook furnace, which is to be torn down.

The Glendower Iron Works at Danville, Pa., have been closed, the men having left on account of non-payment of wages. The company asks for an extension for its creditors. The mill made rails and bar iron, but has not turned out any rails for some time past.

Manufacturing Notes.

The Betts Machine Co., in Wilmington, Del., is building a new erecting shop in which large and heavy tools can be put together. The new shop will be 40 ft. wide, 123 ft. long and 25 ft. high in the centre, and is so designed that it can be easily enlarged. The shop is built largely of iron.

At a meeting of the stockholders of the Reading Iron Works, in Reading, Pa., last week, it was resolved to issue $550,000 in preferred stock. The object of the increase is to pay off the floating debt of the company, and most of the holders of the company's notes have agreed to take stock in payment for the same.

The Morgan Engineering Co., in Alliance, O., is building a crane capable of handling 20 tons for the Betts Machine Co., in Wilmington, Del. The crane will be carried on two plate girders, running the whole length of the building in which it is to be used.

The Rail Market.

Steel Rails.—Very little new business has been reported and it can hardly be said that manufacturers expect much at present, owing to the unsettled condition of financial affairs. Quite a number of orders are offered, but manufacturers are inclined to ask for cash or first-rate security, not being inclined to take any risks when the margin of profit is so small as at present. Quotations may be put at $32 to $33 per ton at mill for rails of ordinary section, and from $35 to $38 for light rails.

Rail Fastenings.—The demand continues light but quotations are noted at $2.35 per 100 lbs. in Pittsburgh for spikes and $2.50 to $2.75 for track bolts. Splice bars are still quoted at $1.65 to $1.75 cents per lb.

Old Rails.—The market for old iron rails is somewhat unsettled, the demand being chiefly for small lots. Sales are reported at $21 to $21.50 at tide-water for tees and $23 to $24 for double-heads. Pittsburgh quotations are from $22 to $22.50 per ton on cars.

Crossing Signals in Indiana.

Auditor-General Rice, of Indiana, has written an official letter approving the Westinghouse system of pneumatic and electric crossing signals tested last week at Hammond, Ind., a description of which is given elsewhere. The Auditor expresses entire satisfaction with the system as being perfectly safe, and gives consent, in accordance with the authority invested in him by the statute, to the use of this system by the roads where tracks cross at that point without stopping trains at the crossing. As soon as General Superintendent E. C. Brown, of the Michigan Central, can consult with General Manager Lewis Williams, of the Nickel Plate, and General Superintendent J. C. Williams, of the Chicago & Atlantic, concerning some details which have not yet been arranged, the roads will accept the plant at Hammond and commence its use.

The Union Switch & Signal Co. has made contracts for putting in the same system of signals and switches at the Union Stock Yards, Chicago, where the Lake Shore and Rock Island roads, each with a double track, cross the stock yard tracks, and also at Valparaiso, Ind., at the crossing of the Chicago & Grand Trunk with the Nickel Plate and Fort Wayne roads.

The Westinghouse Crossing Signals at Hammond.

The system of Westinghouse electrical and pneumatic interlocking switches and semaphores which the Union Switch & Signal Co. has put in for the Michigan Central, the Chicago & Atlantic and the Nickel Plate Railroads at Hammond, Ind., was officially tested yesterday in the presence of Auditor-General Rice, of Indiana, Commissioner of Railroads Innes, of Michigan, and a party of about 25 railroad officials. A special train of one coach and Supt. Brown's private car left Chicago for Hammond at 10 o'clock, with the officers of the three roads interested, and officials of the Louisville, New Albany & Chicago, which road will soon cross the Michigan Central at the same point, and is expected to also adopt the system if it is approved by Auditor Rice. The test was satisfactory in every respect, the apparatus working to prefection.

The system at Hammond is quite similar to the one in operation at Wellington, O., which was examined by the last Michigan Legislature before it passed the law allowing railroads to dispense with stopping trains at crossings where such a system is in use, provided it is first approved by the Commissioner of Railroads. A similar law has been passed in Indiana also. But as that state has no Commissioner of Railroads, the approving power is given to the Auditor. The test yesterday was made especially for the benefit of Auditor Rice. That officer expressed entire satisfaction with its working, but reserved his official opinion, which will be communicated to the roads interested in a day or two. In case he approves of it the roads will be saved great delay, as trains which have the right of way can run the crossing without first stopping, as all trains are now required to do.

The Westinghouse system consists of safety switches and semaphore signals, all operated by one man. On each side of the crossing on each road is a short safety switch 400 ft. from the crossing, terminating in a sand bank, a home signal 500 ft. from the crossing, and a distant signal 2,000 ft. from the crossing. One mile from the crossing is an electric enunciator, which warns the operator of the approach of a train. Unless a train is ready to run to the crossing, all the safety switches stand open and the signals are set at danger. When a train approaches on either track the operator first closes the safety switches on that track. This act closes an electric circuit, which enables him to drop the danger signals and give the train on that track the right

of way. At the same time it locks all the other levers, making it impossible to open the switches or clear the signals on any other tracks. The instant a train enters the section within the home signal it locks the entire set of levers, making it impossible for the operator to move one of them till the train has cleared the crossing. Then he must first raise his danger signal before he can open the safety switches, which were closed, or open another set.

Perfect safety is thus insured, as the operator can make no blunders, no matter how confused or how hurried he may be. The track must be set right before he can permit a train to pass the crossing, and having given one road the right of way, he cannot suddenly change his mind and give it to another.

At the same time the engineer must obey the signals, and even if he disregards them he can do no serious harm, as he cannot reach the crossing. If he makes the attempt he will find himself at the end of a short siding, plowing in a heap of sand, where his engine will stop in its own length.

The power which opens and closes the switches and raises and lowers the signals is pneumatic, instead of hydraulic, as in the Wellington system. At each moving point is one air chamber provided with a V-valve very similar to an ordinary steam chest. This valve is thrown from one position to another by pressure from a small tube filled by a non-freezing mixture of alcohol and water. The pressure required to move the valve is very slight, being applied by the operator by means of a small lever, which requires so little space that a dozen could be operated by one man without moving his position. Electricity does the rest, providing the locking power and insuring perfect safety. The moving of one lever the least bit locks all the others. At the same time the danger signals cannot be cleared until the switch lever is moved to its full extent, and the switch is moved to its place and locked there. A piece of wood or any obstruction which prevents the switch from coming entirely over, prevents the lever which moves it from coming to its place, and renders it impossible to give a train the right of way until the obstruction is removed and it can cross with safety. By a very simple little device the distance danger signal can be raised when the home signal is down, thus detaining a second train until the first on the same track has cleared the crossing.

Commissioner Innes expressed entire satisfaction with this system, and will favor its adoption in all the more important crossings in this state. He thinks that it leaves nothing to be desired and that the only thing which stands in the way of its general adoption is its cost.

At the same time the Commissioner is determined to find some system of uniform crossing signals which shall be moderate in cost. He is now having prepared plans for a set of crossing gates similar in operation to the interlocking switch system.—*Detroit Free Press, May* 24.

A New Officer's Car.

The Pullman shops have lately turned out an officer's car for the Detroit, Lansing & Northern road which is 55 ft. long and has all the latest improvements in running gear, brakes, etc. Its interior arrangement is thus described:

"In one end of the car is a spacious smoking-room and office with convenient and ingenious writing cabinets and desks, lounges and chairs, upholstered in leather. Next to this apartment is a spacious private state room with handsome large double bed, chairs, lavatory and closet. Next is a regular sleeping car section, with four double berths and a lavatory closet off. Next is the kitchen with its cooking range, the steam heater, china closet and cupboards. Between the kitchen and the general section of berths is a wine closet with refrigerator, a linen closet and various other convenient receptacles. Next to the culinary department and occupying the remaining end of the car is a large parlor and dining-room combined, with liberal furnishings. The interiors of all these apartments are furnished in cherry and oak, between each apartment are rich hangings of drapery, the floors are covered with the finest of carpets, choice drapings hang before the numerous windows, and in fact all apartments are, while studiously plain in design, very elegant and pleasing in character. The total cost of the car and its furnishing complete has been about $10,000."

Air Brakes on Freight Cars.

The experimental freight train on the Chicago, Burlington & Quincy fitted with air brakes, made the run from Chicago to Denver in 81 hours. On the road a number of tests of the brake were made, including the cutting of the train in two without the knowledge of the engineer, and several other tests of similar nature. No attempt was made to run the train on any extra time, the ordinary freight train schedule being followed. In fact the trip and the tests made on the road can hardly be called experiments, for no one doubts the desirability of the use of air brakes on freight as well as passenger trains, the only question being as to the expediency of incurring the necessary expense.

Fast Time on the Hudson River.

The new steamboat "City of Kingston," of the Corneil Steamboat Co., arrived in New York from Wilmington, Del., May 26, and has begun to make regular trips. The "City of Kingston" is 255 ft. long, 47 ft. wide, and has a capacity of 1,100 tons. She is to run between West Point, Poughkeepsie, Newburg, and New York, and on her recent trip made 75 miles in four hours, but is expected greatly to surpass this rate of speed, when fairly at work on the river.

Fire-Proof Passenger Coaches.

The cremation of human beings on passenger and sleeping cars, in case of accident, as illustrated in the Ashtabula tragedy, and others of more recent date, has been and still is the greatest horror to be found in railway travel. The light draperies, inflammable upholsterings and heavy varnishes of sleepers and palace coaches, while pleasing to the eye, are food for the flames whenever a car is overturned; and help, however quickly it comes, is too late to save from agony, if not from death. It has been left for a Buffalo inventor, Mr. George Mann, to discover a remedy for this great terrorizer of the traveler. He has adopted asbestos as an upholstering for seats, materials for curtains, and lining for the entire interior of the car; this to be covered, when used for upholstering or ceiling, with a fine wire-cloth on which pleasing designs may be wrought. Asbestos is known to be non-combustible, and a car so upholstered and so lined, in Mr. Mann's opinion, would be almost fire-proof. Passengers would have ample time to escape, or to be rescued before a fire originating from an overturned stove could become dangerous in cars in which asbestos was used. —*Buffalo Express.*

Tree Culture in Kansas.

The annual report of the Kansas City, Fort Scott & Gulf Co. says of the culture of forest trees on the company's land grant in Kansas:

"Messrs. Douglas & Sons, contractors, say that the past year has been very favorable to the growth of the whole plantation. The walnuts and ash have made a better growth than in any previous season, and the same may be said of the catalpa and ailanthus. The catalpas and ailanthus, the former five and the latter four years planted, are from 8 to 16 ft. high, according to the quality of soil on which they are growing; the greater part of them being from 12 to 16 ft. high.

"The catalpas which were planted four years ago are from 8 to 14 ft. high; those planted three years ago, from 6 to 9 ft. high; those planted two years ago, from 3 to 6 ft. high; and those planted one year ago are from 2 to 4 ft. high. The ailanthus planted last spring are from 3 to 4 ft. high.

"During the month of October last there were planted 142 acres of catalpa, which is all the land suitable for the growth of forest trees left on the section, except a few acres adjoining the pond. These should be kept unbroken, to prevent the soil from washing into the pond and filling it up.

"There are now planted 407.3 acres: the remainder of the 640 acres consisting of the pond and land adjoining, dry ravines, rocky and gumbo (alkali) land, which could not be broken."

Street Railroad Curves.

Mr. A. W. Wright has submitted the following note to the Western Society of Engineers, in calling attention to a letter by Samuel McElroy, C. E., on "Track Problems" published in the *Railroad Gazette* March 28, 1884:

Mr. McElroy says, in speaking of street railroads, "that a play of ⅜ to 1¼ in. is allowed on curves of 60 to 75 ft. radius. This is not the *usual* custom. More than 100 street car companies use grooved rails for their curves and lay them to *tight* gauge. This list embraces some of the largest companies in the United States, and curves of 28 ft. radius are passed without difficulty, but the wheel base is usually 6 ft. instead of 8 ft., as supposed by Mr. McElroy.

A few companies prefer one grooved rail inside and one flat rail outside, upon which the wheel travels upon its flange.

The difference in length of rails on a curve with centre radius of 45 ft. turning a right angle of 90°, a very common practice, is 88 75 in.

Therefore, when both wheels are rigid upon one axle the one wheel must slide 7 ft. 4¾ in. Some street railroads, to lessen this resistance, as above stated, have the outside wheel travel around the curve upon its flange. The ordinary street-car wheel has a diameter of 30 in. with flange ½ in. deep. If the inside wheel revolves on its tread and the outside wheel upon its flange this reduces to about one-half the distance it has to slide when traveling upon its tread; but this advantage is considered by the majority of street railroad men as more than equaled by the fact that the flange, being comparatively sharp, soon wears grooves into the flat rail upon which it travels. I have experienced no difficulty from a curve with centre radius of 32 ft. 6 in. laid to tight gauge with grooved rails.

Mr. Charles E. Emery, C. E., reports the extra resistance of curve with 40 ft. radius [equal to a 143° curve] at 41.77 lbs per ton. I have made numerous dynamometer experiments upon curve resistance with horses and men, but the fluctuations were so great that tests were unsatisfactory. So near as I could estimate the increased resistance on curves of 45 ft. radius grooved rails = 66 lbs. per ton.

D. K. Clarke, "Tramways," Vol. II., page 179, estimates the resistance at 22 ft. radius curve as double that of a straight line.

I find that filling the groove with water reduces the friction more than oil, for the latter holds the dirt.

I never narrowed gauge on steam railroads at bridges or crossings.

Cooling Passenger Cars in Mexico.

The *Mexican Financier*, of May 21 says: "Complaint is made concerning the extreme heat which often prevails in the Pullman cars, caused, not by the temperature of the air, which is not excessive on any part of the table-land, but by the fierce rays of the tropic summer sun beating down on the roofs and heating the cars like ovens, so that they do not cool off until far into the night. The remedy for this would be double roofs, or their equivalents in the shape of awnings stretched over the roofs, an expedient which has been tried with great success elsewhere. It is probable that by this means the heat could be reduced by several degrees, and one of the greatest drawbacks to travel by railway removed. The car of the General Manager on the Sonora Railway is thus provided with an awning which gives the most satisfactory results. In order not to obstruct light and air from the ventilating windows it would be advisable to divide the awning into three sections, one being stretched over the raised portion of the roof, or Monitor top, and the remainder over the roof at the sides, below the ventilating windows. It would probably be also desirable to protect the roofs of the first-class cars in the same way, the additional comfort thus giving them a most substantial advantage over the second class."

A Large Wooden Tank.

The New-York, West Shore & Buffalo has been building a huge tank on its road west of the Utica station and has just completed it. It is built of 2-in. plank or staves. The tank is 16 ft. high. The circumference of the bottom of the tank is 75 ft. and its circumference at the top is 72 ft. This tank will contain 49,882 gallons of water.

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette:*

Rome, Watertown & Ogdensburg.

At the annual meeting of this company on June 4 a statement of the operations of its 417 miles of road for the year ending May 31 was presented from which the following figures are taken.

The earnings for the year were as follows:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Earnings	$1,680,626	$1,694,407	D. $13,781	0.8
Expenses	1,147,836	1,355,839	D. 208,003	15.3
Net earnings	$532,790	$338,568	I. $194,222	57.4
Gross earn. per mile	4,030	4,063	D. 33	0 8
Net earn. per mile	1,278	812	I. 466	57.4
Per cent. of expenses	68.3	80.0	D. 11.7	....

The decrease in gross earnings and the reduction in expenses were in part caused by the giving up of unprofitable through traffic.

There has been paid on account of the Carlyon accident, not included in the above statement, the sum of $85,162. It is estimated that $5,000 more will cover the whole cost of that accident.

Since Jan. 1, 1883, over 14,000 tons of steel rails have been purchased, of which more than 12,000 tons have been laid, making 208 miles of steel track now on the road.

Five hundred freight cars and six locomotives have been added to the equipment during the year; $650,000 of consolidated bonds have been sold to obtain the money necessary for purchase of steel rails and to pay a portion of the floating debt. The latter is less than one-half what it was one year ago. The company still owns $566,000 of consolidated bonds.

Hanover Junction, Hanover & Gettysburg.

This company owns a line from Hanover Junction, Pa., to Gettysburg, 30 miles, and works under lease to the Berlin Branch, 7 miles; the Bachman Valley road, 14 miles, and the Baltimore & Hanover, 20 miles, making 71 miles in all. The report is for the year ending March 31.

The equipment consists of 10 locomotives; 14 passenger and 2 baggage, mail and express cars; 51 box, 18 stock, 25 gondola, 29 lime and 2 caboose cars; 1 wrecking car.

The general account, condensed, is as follows:

Stock		$116,850.00
Funded debt		208,000.03
Floating debt and unpaid dividends		20,970.00
Profit and loss		335,066.97
Total		$680,886.97
Road and equipment	$537,380.00	
Stocks of leased lines	110,650.00	
Fuel, materials, etc	7,048.37	
Cash and bills receivable	25,808.60	
		$680,886.97

Stock and bonds were not changed during the year. The floating debt was increased by purchases of material for the extension west of Gettysburg.

The traffic for the year was as follows:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Locomotive miles	163,422	164,282	D. 860	0.5
Passenger-car miles	238,365	248,245	D. 9,880	4.0
Freight-car miles	271,183	280,692	D. 9 509	3 4
Passengers carried	57,615	56,507	I. 1,108	1.9
Passenger miles	929,148	887,028	I. 42,120	4.7
Tons freight carried	95,157	112,125	D. 16,968	15.1
Ton miles	906,120	946,265	D. 40,145	4.2
Av. receipt:				
Per passenger mile	2.53 cts.	2.63 cts.	D. 0.10 ct.	3.8
Per ton mile	4.14 "	3.95 "	I. 0.19 "	4.8

Of the freight-car miles 78,131 were run by foreign and individual cars. The decrease in freight was in coal, limestone and iron ore, freight carried short distances at low rates.

The earnings of the year were as follows:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Freight	$37,762	$37,465	I. $297	0.2
Passengers	23,894	23,445	I. 449	1.9
Mail, etc.	12,281	7,692	I. 4 589	59.6
Working leased lines	29,248	25,358	I. 3,910	15.6
Total	$102,985	$93,940	I. $9,045	9.6
Expenses	70,297	60,154	I. 10,143	16 9
Net earnings	$32,688	$33,786	D. $1,098	3.2
Gross earn. per mile	1,450	1,323	I. 127	9.6
Net " "	460	476	D. 16	3.2
Per cent. of expenses	68.3	64.0	I. 4.3	....

The earnings of the road owned, excluding the leased lines, were $3,433 gross and $1,090 net per mile.

The income statement is as follows:

Net earnings, as above		$32,688.27
Coupons	$13,192.40	
Dividends	4,406.29	
Construction and equipment	13,092.60	
		30,691.29
Surplus for the year		$1,996.98
Balance from previous year		23,811.62
Balance, March 31, 1884		$25,808.60

During the year 408 tons of steel rails and 7,274 new ties were laid; a large amount of stone was quarried and used for ballast. A new freight locomotive with Wootten fire-box has been ordered.

The report of President Eichelberger says: "With a view to utilize the eastern portion of the roadbed of the old Pennsylvania Railroad, commonly called the 'Tape-Worm'—the graduation and masonry of which was mainly completed by the state government in 1837—the directors ordered the road-bed to be put in condition to receive the cross-ties and rails from Gettysburg to a point on the Crone place, near the foot of the mountain, a distance of about 9 miles. It is intended for this track to be laid with the iron rails to be removed from the Gettysburg Division, for which steel is to be substituted. Work on this was commenced last fall and about two miles of track have been put down, the cost of which has been charged to the construction account, and the graduation completed for a half mile more. * * *

"An agreement was entered into with the Gettysburg & Harrisburg Railroad Co. by which that company was given the right to cross the track of this company at grade at a suitable point between Mumper's house and the bridge over Stevens' Run, for the purpose of extending their road to Round Top—also to lay their track on the north side of the graded road-bed of this company from a point east of the crossing to Washington street in the borough of Gettysburg. In consideration of which this company shall at all times have the right to use the track of the other to Round Top for all organized excursion trains and all the terminal facilities and improvements made there, for which payment of passenger fares on a *pro-rata* basis of five miles is to be made. The prospect of inaugurating a profitable semi or tri-weekly excursion business from Baltimore during the summer months, was the object in encouraging the building of the road to Round Top."

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

SAFE BRIDGE FLOORS.

We publish elsewhere a summary of a paper contributed to the American Society of Civil Engineers by Mr. W. Howard White, which makes a point of some force in respect to the construction of bridge floors, and brings up for consideration what is required to make a thoroughly good bridge floor.

That it is not impossible to make a bridge floor which, in connection with the approaches, shall be practically perfectly safe against all accidents *on the bridge*, is shown by the experience of the New York elevated railroads, which have 34 miles of continuous bridge-floor on which derailments have not infrequently occurred, and yet which has so far always proved sufficient to prevent serious catastrophe. Unfortunately, the experience thus gained has no bearing on Mr. White's chief argument in favor of inside instead of outside guard rails, since the elevated railroads use both.

In December, 1881, the Massachusetts Board of Railroad Commissioners took up this question, but in strictly non-committal fashion, presenting eight different designs to the various companies for them to choose from, and only asking that a choice should be made. Curiously enough, not a single one of these designs agrees in general features with Mr. White's. They are all shown together in the *Railroad Gazette* for Jan. 20, 1882, and only two of them show an inside guard rail at all. One of these shows both inside and outside guard rails; one only, inside guard rails alone, and these are iron or steel rails laid close to the main rails and not wooden guards. To such guard rails the objection is very reasonably advanced that they offer too great facilities for malicious derailment, and although in quite general use on the Lake Shore & Michigan Southern and other lines, they have never been widely approved of.

Mr. White defines very carefully the requisites for a safe floor and how they can be met, and in respect to the different ways of supporting the ties he distinguishes six cases. Two of these, requiring the ties to be long and stout, he considers unusual. Evidently Mr. White is of the opinion that, wherever practicable, the stringers should be placed directly under each rail; but on this point alone there is still much diversity of opinion among engineers. Some prefer to place the stringer at one side of the rail, giving as a reason, that thereby the riveted floor-beam connections are better protected against the unavoidable pounding of the wheels, each tie acting as an elastic beam or spring, as it were, absorbing or lessening the effect of the shocks. For this purpose two stringers are sometimes used, about one foot further apart than the rails; sometimes three stringers, one of which is under the middle of the track, and sometimes four stringers, two at each side of each rail. Four stringers for each track are often used, so that a heavy stringer is under each rail and lighter side stringers under the ends of the ties. These side stringers are merely for the purpose of holding up the ties under a derailed car. Very many engineers prefer wooden stringers, on account of their elasticity, even on iron bridges.

The history of the development of bridge floors is somewhat curious. The precautions for a safe floor on railroad bridges in this country never take a more expensive form than a structure of stout and closely laid ties and a number of parallel stringers for each track; but some English and Australian railroads still build bridges with a floor of iron buckle-plates and stone ballast, into which the regular ties are imbedded. Here we see the notion of a safe floor and of absorbing shocks from trains taking a very expensive form. There can be no doubt that the same bridges, relieved of the weight of buckle-plates and stone ballast and with closer ties would be stronger, and safer for derailed cars or locomotives. Another notion prevailed at one time, that iron bridges, to be fireproof, should have no wood in them, and consequently the rails were clamped directly to the top of the stringers. Such bridges still exist in Canada, in England and on the Continent. The noise of a train over such a bridge is deafening, and the violent uncushioned blows from the wheels are destructive to the connections. There is no provision for derailed cars, and commonly bridge and train in such a case go down together.

Closely laid stout ties on bridges are used on nearly all the best American railroads, although there are some notable exceptions, in which the rail is still laid directly on a longitudinal stringer. Often the ties are closer together than 5 in., which Mr. White presumably recommends as a minimum. Otherwise such wide spacing of ties would justly, we think, excite much opposition. The calculations which Mr. White makes to show that they are sufficiently near are in great degree deceptive, since they conceive the wheel to be rolling over the tie *without cutting into it*. If the same calculations be made, allowing that the wheel will cut in an inch at the edge of each tie, they will tell a very different story as to the importance of placing the ties nearer together. When they are so placed, of course, the guard-rail cannot be gained down over them, and separating blocks must be used for spacing the ties.

The short length of ties proposed seems also open to objection. A length of 8 ft. for the bridge ties and an inside guard-rail, as Mr. White proposes, would appear to be all-sufficient where the safety of the train *alone* is considered. But some regard should be had for safety of persons meeting a train on a bridge. Trackwalkers, sectionmen, brakemen and other employés must sometimes walk over bridges, and if it is said that they know how to get out of the way of trains, or that at any rate they know the risks of their vocation, yet experience shows that no inconsiderable number of such employés are killed or injured on bridges, and it is brutal to compel them to take such risks for the sake of a small economy. It is also urged, and is doubtless true, that if railroad bridges were made safer for pedestrians, tramps and other unauthorized persons would be more likely to cross them; but a railroad company should not neglect to protect its men because if they are made safe there will be more heedless trespassers. When there are bridge watchmen, trespassers can be kept off; and in a situation not requiring a watchman, the number of trespassers is not likely to be great.

In some instances railroad companies have provided sidewalks, or other sufficient substitute, for the safety of employés and others; but this humane example is not generally followed.

On Howe truss bridges it is comparatively easy to step out of the way of a train, the long floor beams being close together. But on iron bridges, with the floor beams far apart and narrow, this is not always easily done, and on iron trestles it cannot be done without great danger to life and limb. Sometimes the only way to escape on a trestle bridge is to roll off from the end of the ties and to clutch the outside guard-rail with one arm and leg. With merely an inside guard-rail, nothing is left but to jump off or to be run over. Occasionally and at long intervals on long trestles or bridges, poor provision is made for stepping out on to a projecting platform some 3 ft. square, but as a rule it is not fenced in, and generally it is obstructed by a rotten, half-empty water barrel. The platform is not usually safe for more than one man, while as a precaution against fire, the barrel is of about the same value as the old worm-eaten fire buckets.

It is strange that among the various other details which Mr. White so carefully considers, he should not have devoted more attention than he has to the use of some rerailing device in connection with the guard-rails. The only allusion to them in the paper is an incidental reference to their use as "possible," at the very end of the paper; yet they have been known in several instances to prevent serious accidents. One was devised many years ago by Mr. Charles Latimer, of Cleveland, which is now in use on several railroads, and is said to be very effective. It consists in bringing the inside guard-rails together to a point, as advocated by Mr. White, and filling the space between the point and the rails, and correspondingly on the outside of the rails, with iron-sheeted planks forming an inclined plane, on which the derailed wheels run up, guided by the guards, and are lifted back upon the track. As the height of the inside guard is limited to that of the rail, it is of course not as efficient as it could be made otherwise.

Mr. White's estimates seem reasonable, that a 4 in. inside guard is equal to a 5¼ in. outside guard, and hence that the inside guard is always to be preferred where only one is used, but *solid* construction of any kind is better than the carelessness still so often seen. There are still many railroad bridges and trestles, on which the floor consists merely of short, thin ties, irregularly spaced, often broken and loose, without guard-rail and even without any ties at all. It is only recently that such a defective floor was the cause, as shown at a coroner's investigation, of a serious accident to a passenger train, in which several passengers were killed or injured. The loss to the company in a single accident of this kind would put in excellent and safe condition the floors of very many bridges.

It must be remembered that the danger to bridges and trains from derailed cars has become greater in proportion with the increased length of trains. Formerly 15 to 20 cars made up a good-sized freight train, and a derailed car was readily discovered. But now, with the number of cars running from 25 to 100, a derailed car has been known to be hauled 30 miles over the ties before it was discovered.

The standard floor as proposed by Mr. White has many points in its favor for safety, and its cost appears to be no more, if not less, than many defective arrangements now in use. But the necessity on long bridges and trestles of providing roomy, fenced side platforms or plank walks for persons meeting a train under such perilous circumstances, should be remembered; some form of rerailing device should be used by all means, and the ties should be placed nearer together than Mr. White proposes.

APRIL EARNINGS.

Our table of railroad earnings in April, on another page, has reports from 73 railroads, whose aggregate mileage and earnings and average earnings per mile this year and last were:

	1884.	1883.	Inc. or Dec.	P. c.
Miles	50,295	46,768+	3,527	7.5
Earnings	$27,107,361	$25,417,817+	$1,685,237	6.6
Earn per mile	539	543—	4	0.8

This is a somewhat less favorable comparison than was made two or three weeks ago, when many of the roads had not reported. The comparison cannot be called unfavorable, however, as the decrease in earnings per mile is insignificant; but April was not a favorable month last year, 76 roads then reporting a decrease of 2.2 per cent. in earnings per mile compared with 1882, when the earnings per mile were nearly the same as in 1881, when they were nearly 3 per cent. more than in 1880. Last year March was an extraordinarily favorable month, and earnings fell off in April. The difference is seen clearly in the following statement of the 71 roads that reported in both March and April:

	March.	April.	+or—in April.
1883.....	$26,334,252	$24,242,874	—$2,091,378
1884.....	25,552,807	26,863,235	+ 1,310,248

For the two months these 71 roads earned $50,577,126 last year, and $52,426,042 this, having shown a *decrease* of $791,445 in March, and an *increase* of $2,620,361 in April. The increase is chiefly due to the larger mileage this year, but the comparison is made to show not this, but the different courses of the two months, which was due chiefly to an exceptional course last year.

Of the 73 roads reporting for April, 24 show a decrease in total earnings, and 33 a decrease in earnings per mile. Some very large gains are shown, chiefly by Southern roads, or by roads that still have very light earnings, but also by the Northern Pacific, the Fort Scott & Gulf, the St. Louis & San Francisco, and the West Jersey. How great differences there are in earnings per mile is shown by the following statement of the 10 that are largest and smallest:

Largest:	Per mile.	*Smallest:*	Per mile.
Pennsylvania.....	$1,976	Vicksburg & Shreve.....	$45
Reading	1,831	New Orleans & Nor'east.	130
Northern Central	1,412	Green Bay, W. & St. P...	137
Eastern	937	Houston, E. & W. Tex...	138
Chicago & Alton... ...	714	Little Rock, M. R. & T...	144
N. Y. & New England....	689	Char., Col. & Augusta...	154
Central Pacific.....	677	Col. & Greenville.....	154
Missouri Pacific.....	632	Western N. C.....	161
Cincinnati Southern	629	Florida Ry. & Nav.....	161
Flint & Pere M.....	598	Marquette, H. & O... ...	177

No other road earned as much as $600 per mile last April, but one other earned less than $200 (the Mil-

waukee & Northern, $197), and six others earned less than $250 per mile.

The four roads northwest of St. Paul make the following showing:

	1884.	1883.	Inc. or Dec.	P.c.
Miles	6,143	4,310 +	1,833	42.6
Earnings	$2,670,801	$1,956,719 +	$714,172	36.5
Earn. per mile	435	454 —	19	4.2

The Northern Pacific gained 47 per cent. in earnings per mile, while the Canadian Pacific lost 5? per cent. There was a slight decrease on the Manitoba and a slight increase on the St. Paul & Duluth. The figures indicate that the gain is due chiefly to traffic on the Northern Pacific west of Dakota, and that there was little change in the Minnesota and Dakota traffic. For the three months previous to April there had been an increase of 17¾ per cent. in the aggregate earnings of this group and a decrease of 8½ per cent. in their earnings per mile.

The only road in the Far West further south that has reported for April is the Central Pacific, which earned nearly the same as last year, having for the three months previous shown a *loss* of 12 per cent.

Thirteen other roads west and northwest of Chicago report as follows:

April:	1884.	1883.	Inc. or Dec	P. c.
Miles	13,804	12,950	+ 854	6.6
Earnings	$5,728,124	$5,571,719	+ $156,405	2.8
Earn. per mile	415	430	— 15	3.5

These same roads for March and the first three months of the year reported:

	1884.	1883.	Inc. or Dec.	P. c.
March	$5,536,783	$6,186,932	— $650 149	10.5
Three months	14,603,373	14,551,756	+ 51,617	0.4

Thus April, comparatively, was a great improvement over March for these roads this year, and over the three months ending with March, their aggregate gain having been three times as great in April as in the whole of the three months preceding. But it was in this group that the March earnings were particularly heavy last year and the April earnings comparatively light. We see that last year they earned $615,213 more in March than in April, and this year $191,341 more in April than in March, and taking the two months together their earnings were $493,744 the greater last year.

Of the 13 roads in this group only four have a decrease in total earnings in April, but nine have a decrease in earnings per mile, and the only important increase in the latter was on the St. Paul & Omaha. Very few of these roads have an unchanged mileage, and those that have no increase show very little change in earnings, except the Green Bay & Winona road and the Iowa lines of the Illinois Central, both of which have a decrease of about one-sixth. The 10 roads west and southwest of St. Louis that report give the following totals:

	1884.	1883.	Increase	P. c.
Miles	4 450	4,260	190	4.5
Earnings	$2,024,403	$1,815,122	$209,281	11.5
Earnings per mile	455	426	29	6.7

Here we have a large gain in earnings per mile, though most of the roads in the group that reported last year had a gain last year also, and though the conditions this year south of Missouri and Kansas have been decidedly unfavorable. We have for April the earnings of the Missouri Pacific and the Iron Mountain, which have not been given before for separate months this year, and make nearly three-fifths of the total. They show (together) a gain of 4 per cent. over last year, when they reported a gain of 2¾ per cent. over 1882. For the three months ending with March this year, they had a decrease of 1.3 per cent. Judging by the other roads reporting, there was a considerable increase on the Missouri Pacific, and a considerable decrease on the Iron Mountain this year in April.

The nine Southwestern roads that have reported both for April and the three months previous show an increase of $214,809 (12 per cent.), in total earnings in April, and of $277,236 (4½ per cent) in the three months, thus showing a considerable relative improvement in April. Large gains in April are shown by the Ft. Worth & Denver, the Ft. Scott & Gulf, and the St. Louis & San Francisco; the Houston, East & West Texas, and the two Little Rock roads alone show a decrease in total earnings, but the Gulf, Colorado & Sante Fe has a small decrease in earnings per mile. Altogether this group of roads has been doing better than was to be expected.

Turning now to the roads east of Chicago and St. Louis and north of the Ohio, as far east as Pennsylvania, where are the chief eastern outlets of all the groups heretofore described, we have reports from 15 for April, in the aggregate as follows:

April:	1884	1883.	Increase.	P.c.
Miles	5,888	5,774	144	2.5
Earnings	$2,682,061	$2,599,657	$82,404	0 4
Earnings per mile	455	453	2	0.5

That is, in the aggregate they did substantially as well as last year and much better than in previous months of this year, for the earnings of these 15 roads in March and the three months ending with March were:

	1884.	1883.	Decrease.	P.c.
March	$2 ?92,163	$3,103,986	$2 1,823	6.8
Three months	7,836,347	8,448,200	611,853	7.2

A change from so great a loss to ever so small a gain is a decided improvement. The immediate western connections of the trunk lines belong to this group, on which the low east-bound rates of April and the enormous shipments of that month (larger than ever before) were having their effect. But the more important of these, like the Michigan Central, the Lake Shore, the Fort Wayne and the Panhandle do not report, and even the Chicago & Grand Trunk, which previous to March reported early enough for this table, is lacking now. Of the lines that do not report likely to have much of this traffic the Alton & Terre Haute Main Line shows an increase of 7½ per cent. over last year, the Ohio & Mississippi a decrease of 1½ per cent., the Cincinnati, Washington & Baltimore a decrease of 5½ per cent. and the Indiana, Bloomington & Western a decrease of 9½ per cent.

Compared with March and the three months ending with March these roads show the following earnings:

	April.	March.	3 mos. to March. 31.
Ind., Bloom. & West	$195,751	$224,340	$633,805
Do., 1883	215,914	268,801	719.8?5
Alton & Terre Haute	1 0,007	129,409	371.42
Do., 1883	102,276	133,093	393 952
Ohio & Missi-sippi	3?2,778	42?,648	994,950
Do., 1883	337,085	391,617	1,025,067
Cin., Wash. & Balt	134.628	164,101	404.043
Do., 1883	142,522	164,748	439,961

We see that all of these roads made smaller earnings in April than in March this year, though this was not the general course of earnings, and though the total through east-bound shipments were much larger in April—from Chicago 40 per cent. more than in March. It is true that last year also the March earnings were the larger, but that was the general course of earnings then, when also the March shipments eastward (judging by the Chicago shipments) were nearly twice as great as the April shipments. The other chief indication of the effect of the 15-cent rate is in the Eastern group, where the Grand Trunk shows a decrease of 15 per cent. in earnings, against a decrease of 12 per cent. in March and of 9½ per cent. in the three months ending with March, so that of its total decrease of $630,197 for the four months, 35 per cent. came in April. The Pennsylvania, on the other hand, shows an increase of 2½ per cent in April, against a decrease of 4½ per cent. in March, and 6 per cent. for the three months.

The only considerable gain in this group is by the Illinois Central (including its Southern Division, however), the Ohio Central, the Evansville & Terre Haute and the Belleville Line of the Alton & Terre Haute. The larger losses are by the Eastern Illinois, the Flint & Pere Marquette, and the Indiana, Bloomington & Western.

The 20 reporting railroads south of the Ohio and the Potomac and east of the Mississippi make the following showing:

April:	1884.	1883.	Increase.	P.c.
Miles	9 ?94	9,277	313	3.4
Earnings	$3,566,137	$3.122,822	$443,315	14.2
Earn. per mile	372	337	35	10.4

This is a most favorable showing, and a surprising one in view of the crops of the two years, and in view of the fact that most of these roads had an increase in April last year also, the exceptions being the Louisville & Nashville, the Mobile & Ohio, and the Nashville, Chattanooga & St. Louis, which last year had together the trifling decrease of $36,096, and this year have the large increase of $224,166.

We compare below the earnings of these 20 roads in April with their earnings in March and the first three months of this year in both years, as follows:

	April.	March.	3 months to March 31.
1884	$3,566,137	$3,881,. 18	$11,0?3,594
1883	3,122,822	3,882,841	10,969,967
Increase 1884	$443,315	.....	$43,627
Decrease 1884	.....	$1,523	.....

The April earnings were less than the March earnings both years, which is usual with Southern roads, but the decrease from March to April was great last year and comparatively small this year. The gain over last year was *ten times as great* in April as in the whole of the previous three months. It is, however, somewhat surprising that there should have been a gain at any time this year. So far as railroad earnings go they indicate that the South, in spite of last year's bad crops, is relatively more prosperous than the rest of the country.

We now come to the Eastern railroads—those east of Pennsylvania and north of the Potomac—ten of which report as follows (omitting the Central of New Jersey, which did not report last year):

	1884.	1883.	Inc. or Dec.	P. c.
Miles	7 413	7, 86+	327	4 5
Earnings	$8.734, ?3	$8 638,55 +	$95,972	1.1
Earn. per mile	1,178	1,186—	8	0.7

There is thus virtually no change in the earnings per mile of this group, which is favorable, for the nine of them which reported last year had an increase then of $460,224 over 1882. And they make a better showing in April than in previous months of this year, the earnings of the ten in April, March, and the three months ending March having been:

	April.	March.	Three mos. to March 31.
1884	$8,734,523	$8,174,680	$22,990, 32
1883	8,638,551	8,774.286	24,849,390
Increase, 1884	$95,972	.....	.....
Decrease, 1884	.....	$599,606	$1,858,958

For a decrease of nearly 7 per cent. in March, and of 7½ per cent. for the three weeks ending with March, to be followed by an increase, though of only 1 per cent., in April, is a very decided improvement. Six roads gain and four lose in total earnings, and five gain in earnings per mile. The most important gains are $157,170 (8¾ per cent.) by the Reading, and 9 per cent. by the Long Island. The Rochester & Pittsburgh's gain of 166 per cent. is from the very light earnings of $141 per mile, to the still light ones of $284. The Grand Trunk has the serious loss of 15 per cent., amounting to $221,152, against an increase of $98,236 (7¾ per cent.) from 1882 to 1883, so that it is this year much below the earnings in 1882, which was a very unfavorable year. The Northern Central decrease is 4½ per cent. Some of these roads reflect to a considerable extent the general condition of traffic in the country, and as a whole they make a favorable showing.

Below we give for as many roads as possible the earnings per mile of road in April for six successive years:

	1879.	1880.	1881.	1882.	1883.	1884.
Ala. Gt. South	$105	$156	$201	$.97	$253	$291
Burl., C. R. & N.	231	288	3?7	276	306	305
Central Iowa	....	....	401	355	330	3?7
Central Pacific	645	577	723	698	697	677
Char., Col & Aug	174	188	267	?02	156	154
Ches & Ohio	374	510	5?3	615	577	573
Chicago & Alton	495	646	6?5	665	701	714
Chic. & E. Ill	384	528	609	5 6	491	457
Chic. & N. W.	524	574	650	601	490	4?9
Chic., Mil. & St. P	383	3?9	931	356	436	409
Ch., St. P., M & O.	355	355	275	374	371	425
Chic. & W. Mich	212	271	...	261	333	342
Cin., Ind., St. L. & C.	517	504	612	506	418	419
Cin., N. O. & T. P.	...	...	518	495	515	629
Cleve., Ak. & Col	200	231	246	277	282	281
Col. & Greenville	....	...	...	143	145	154
Des. M. & Ft. Dodge	...	216	423	305	168	203
Det., Lansing & N.	460	519	493	593	605	534
Eastern	688	878	866	909	942	9?7
E. T., Va. & Ga	248	315	...	245	258	261
Eliz. L. & B. S.	...	...	...	?79	396	453
Evansville & T. H.	...	...	...	447	378	4?1
Flint & P. M.	335	436	530	547	680	598
Green Bay & St. Paul	...	...	...	142	167	137
Gulf, Col. & S. F.	...	...	...	180	250	242
Houston, E. & W. T.	...	...	144	222	207	138
Ill. Cen. in Iowa	284	308	395	348	300	3?7
Ill. Cen., Ill & So. Div.	400	450	540	498	466	5?2
Ind., B. & West	425	5?6	567	571	511	2?7
K. C., Ft. S. & G.	....	271	532	471	345	45?
Little Rock & Ft. S.	...	...	....	168	218	204
L. R., Mis. R. & T.	...	...	....	135	175	144
Long Island	....	....	447	448	481	527
Louisville & Nash.	407	435	462	470	469	535
Marquette, H. & On.	....	....	193	385	173	177
Memphis & Char.	....	....	....	244	277	348
Mil., L. S. & W.	...	140	175	246	276	256
Mobile & Ohio	232	280	322	2?9	244	322
Missouri Pac*	...	....	782	745	607	632
Nash., Chat. & St. L.	368	340	?93	318	233	340
N. Y. & New Eng.	....	6?3	686	659	690	6 9
N. Y., Sus & W.	....	....	....	606	534	560
Norfolk & Western	276	3?4	407	401	446	422
Northern Central	1,?69	1,188	1,495	1,306	1,4 9	1,412
Northern Pacific	180	258	299	464	391	576
Ohio Central	....	....	?53	2 7	?93	304
Pennsylvania	1,551	1,863	1,900	1,973	1,983	1,976
Peoria, Dec. & Ev.	...	231	210	264	250	231
Phil & Reading	1,422	1,616	1,494	1 720	1.7?7	1.883
Rich. & Danville	299	332	431	347	35?	419
Roch. & Pitts	....	....	158	235	141	284
St. L., A. & T. H. —						
Main Line	360	556	684	502	524	564
Belleville Line	582	662	530	557	487	551
St. L. & San Fran.	249	330	448	368	3?8	485
St. P. & Duluth	...	....	....	326	303	309
St. P., Minn. & Man.	429	508	575	636	649	580
South Carolina	251	278	244	323	3?5	297
Va. Midland	....	...	....	315	357	372
Vicks. & Meridian	....	...	247	216	2 6	254
W stern N. C.	....	....	....	98	115	160
West Jersey	321	...	...	419	4?4	496
Wis. Central	....	....	238	305	283	283

* Including Iron Mountain.

Here we find the Alabama Great Southern, the Chicago & Alton, the St. Paul & Omaha, the Chicago & West Michigan, the Cincinnati Southern, the Long Island, the Louisville & Nashville, the Northern Pacific, the Ohio Central, the Reading, the St. Louis & San Francisco, and the St. Paul & Duluth, all with larger earnings per mile this year than in any other since 1878 at least—and most of them with the largest they have ever had in April. Only of the Indiana, Bloomington & Western and the Chicago & Northwestern is the reverse true, their earnings per mile being the smallest since 1878. In 1880 and 1881 earnings were considered extraordinarily good, but 25 out of 47 roads had larger earnings per mile in April this year than in 1881, and 29 out of 33 have larger earnings than in 1880. Of course this does not tell the whole story, for expenses have increased greatly on many roads, and fixed charges on many. But it shows that traffic cannot have been small.

The Erie, the Reading and the Wabash.

Three great companies were unable to meet all their obligations at the beginning of this month. The interest on the largest issue of the Erie bonds, the second-mortgage consolidated 6s, of which about $33,600,000 are outstanding, was not paid when due, June 1. The possibility of temporary inability to pay this interest was contemplated, however, when the mortgage was drawn, and it provides, as was well known, that the bondholders shall not have the right to foreclose until there are six successive coupons unpaid, the company being required to pay the coupons in their order when it does pay. The interest is something more than $2,000,000 yearly, and nearly 40 per cent. of the company's total interest account. When the company was reorganized it was not by any means thought certain that it could pay interest on all its debt, otherwise this reservation would not have been made. But with the great growth of industry and traffic that followed soon after the reorganization and the great improvement in the position of this company, confidence in these bonds increased, and the price at one time in 1881 rose to 108, and it remained above 90 in the early part of this year, so that doubtless they have been purchased by many as a trustworthy source of regular income. But the net earnings of this company this year have been exceptionally light, and, though they have been published for but three of the six months during which the June coupon of these bonds was accruing, there can be little doubt that the net earnings must have been much less than the fixed charges for these particular six months. But it has doubtless happened before, and more than once, that this company did not in that half of the year earn one half of its interest, etc., for the whole year. It is the bad half of the year always. But it was particularly bad this year, and in view of the uncertainty as to a considerable improvement in earnings in the following six months (because a chief cause of the reduction was the opening of new railroads, which will be quite as active next fall as they were last winter, and probably more so), it is questionable whether the company would have been justified in borrowing money to pay the June coupons this year, even if it had had its resources as fully at command as usual. Unfortunately it did not have them at command. It had indorsed the notes of its Chicago connection, the Chicago & Atlantic, which taking its second mortgage bonds as collateral, had raised money on them through Grant & Ward, and this firm sold the notes and pledged the collateral to different parties, and a considerable portion of these second mortgage bonds are in the hands of innocent holders. It did not help the credit of Erie any when it became known that Grant & Ward had been acting as its financial agents, but even if it had, the loss of the collateral very seriously diminishes its ability to borrow money.

Most people seem to have forgotten the great difficulties which this company has had to contend against. When reorganized it had been for years almost stationary, while the other trunk lines had been transformed and had secured great systems of connecting lines to work in their interest. It started late to fit itself to compete with the trunk lines on either side, with limited capital and credit. Fortunately for it, business, after years of stagnation, began to revive soon after it was reorganized, otherwise it might never have fairly got upon its feet. We had three or four years of extraordinary activity and prosperity, and this company utilized them to establish itself and extend its connections and traffic to an extent that seemed hardly possible at the time of the reorganization. It was then an imperfect road, very imperfectly and inadequately equipped, unable to do work as cheaply as other roads, and unable to command anything like so large a share of traffic as its two principal rivals. But it has been so improved that it costs it, apparently, as little as it costs the New York Central to carry freight, and it has a larger freight equipment than that road. Then it was a road from New York to Buffalo and Salamanca, with no western connection under its control and no adequate New England connection. Now it controls lines to Chicago and Cincinnati, and has greatly increased its New England business; and its connections have been secured without incurring any large obligations. Nearly all the obligations are contingent, but they are not likely to amount to a large sum in any case.

It is true that these improvements and extensions are completed only when the period of exceptional prosperity seems to have neared its close; it is also true that there has been a multiplication of roads by other companies, some of which are new competitors of the Erie in fields where its traffic has been most important; and it may be that these may divert as much traffic as the Erie's new connections may bring, or even more. But these rivals of the Erie would have been built just the same if the Erie had made no extensions, and then it would have had no gains to balance the losses. With four roads between New York and Buffalo instead of two, and eight roads from Chicago eastward, instead of five, that line which keeps anything like its old proportion of the through traffic does wonders.

The Erie has also incurred considerable obligations for lines to bituminous and anthracite coal fields, intended to increase its coal traffic, which is already immense; and these are ready for use at a time when the demand for coal has fallen off, so that it may get little benefit, or less than was expected, from these additions to its property. But with a return of prosperity and such growth as there was for a few years after 1878, the Erie will be in position to command a very large share of the increase.

The Reading went into receivers' hands again last Monday, having but recently got out of them. To ordinary mortals it has long seemed strange that any one should expect it to keep out long; but many Philadelphians had great faith in the company, and the notice that receivers had been applied for shocked them. It has a vast and enormously valuable property, but has a debt out of proportion even to its property.

The Wabash is a vast agglomeration of railroads, nearly all of which had been bankrupt, formed when business was most prosperous. It includes a few valuable railroads and many which have very little value. Its debt is not large in proportion to its mileage, but very large in proportion to its profits. It was so confidently expected that it could not continue to pay its interest, that the announcement of the fact and of the receivership had scarcely any effect on the price of the stock and most of the bonds.

Two weeks ago we made some comments on a telegraphic report of a paper on the consumption of timber for railroad ties, read before the Forestry Congress by Mr. John S. Hicks, of Long Island. The statement of the acreage of forest required to keep the railroads in ties was so fearfully large that we assumed that the telegraph had multiplied the number by 100, but it appears from Mr. Hicks' paper, which we publish in full this week, that it was three instead of two ciphers that were added, and his actual estimate is 12,672,000 acres. This, however, is based on an incorrect estimate of the mileage of track in the country. Actually there are now fully 148,000 miles of railroad *track* in the United States, and therefore about 391,000,000 ties, and the average consumption for renewals should be about 56,000,000, or the product of 560,000 acres of land, at 100 ties per acre, requiring 126,800,000 acres = 26,000 square miles, equal to less than half the area of Michigan or Wisconsin, two-thirds the area of Maine, and a little more than half the area of North Carolina, if, as reported, it takes 30 years to grow tie timber.

Mr. Hicks says that the reports to the Forestry Department show that it takes an average of 30 years to grow timber large enough for ties and that the product is about 100 ties per acre, while the average cost of ties to the railroads is 35 cents. This is a product worth $35 as the return of an acre for 30 years. If this is all, then with money at 5 per cent., no cost of cultivation and no taxes, it will pay to grow ties on land already wooded worth $8 per acre, and on land worth $7 per acre if interest is 6 per cent.

If 113.3 acres of woodland are required to maintain the ties of every mile of railroad, the question with the railroads is not simply whether they should produce their own ties, but also whether they may not profitably diminish their consumption. The experience of Germany indicates that an average life nearly three times as long can be had by preserving the ties with chloride of zinc or creosoting (so-called; for there is usually little or no creosote in the oil used). But even if the product of 56 acres per mile is required, it does not follow that the only escape from a famine will be the cultivation of timber. If land planted or stocked naturally with the trees which will make 100 ties in 30 years is worth $20 an acre—and in many parts of the country it is worth as much as that—at the end of the 30 years required to grow the trees it will represent, with interest at 6 per cent., $118, and with interest at 5 per cent. $88; and if then the land after the ties are cut is still worth $20 an acre, the 100 ties, before cutting, will have cost $98 in the one case and $68 in the other. But the taxes meanwhile would probably have cost $50 or $60 more, and there would be some expenditure for care. If then the land is not cheaper than $20 per acre, the railroad will probably do better to depend upon some metallic substitute than to grow tie timber, even if it gets 14 year's life out of a tie.

There are probably cases where railroad companies can well do something to produce or preserve their tie supply, but it will probably be found with tree-growing as with most other things, that it is managed best by those whose sole business it is. A railroad administration is created primarily to work a railroad, and it is more than usually successful if it does that reasonably well. It is not likely to do as well at farming, manufacturing or tree-growing. If it has in its estate lands good for timber which it needs to keep, it should, of course, do its best to utilize them in the best way; and many roads probably have such lands in their right of way, though not enough to supply many ties. The roads which have great quantities of land were given them to sell, not to keep and cultivate, and most of these that are fit for forests are going pretty fast. With the exception of the Northern Pacific's, what is left of the vast land grants west of the Missouri is not suitable for tree-growing. If it is profitable for a railroad company to grow trees, it should be for any other landowner, and the individual is much the most likely to succeed. Planting for wind-breaks, etc., and for the utilization of land not likely soon to be marketed may often be of very great importance, and has been practiced somewhat. We believe, however, tha experiments on a somewhat extensive scale in Nebraska and Kansas were not encouraging.

The Pittsburgh, Cincinnati & St. Louis Railway, not including the numerous lines which it works, but only the 193 miles of main line and 8 miles of branch between Pittsburgh and Columbus, which is the outlet of the entire southwestern system of the Pennsylvania and of one of its Chicago lines also, has made steady but not rapid progress in traffic during the last four years, the number of *millions* of passenger and ton miles over it for four years having been:

	1880.	1881.	1882.	1883.
Passenger miles	36.3	38.5	39.4	40.4
Ton miles	385.2	401.9	415.4	4?8 3

The increase over last year is 2½ per cent. in passenger and 3 per cent. in freight traffic, and since 1880 it has been 11 per cent. in both passenger and freight traffic. As on most other roads carrying much trunk-line traffic, the increase in earnings over 1882 was much greater than the increase in traffic—5.8 per cent. in passenger and 10.7 per cent. in freight earnings, due to an increase from 2.52 to 2.62 cents in the average fare per mile, and from 0.72 to 0.76 cent in the average rate per ton per mile. The passenger rate was the highest for four years; the freight rate the highest since 1880. The effect on gross earnings was an increase over 1882 of 9.7 per cent., to $4,623,740, which is at the very high rate of $23,015 per mile of road. But there was also the large increase of 9 per cent. in working expenses, and the increase in net earnings was 11 per cent., to $1,536,275. The increase in expenses was in the motive power department, which, though it had less than 3 per cent. more traffic to haul, expended 43.7 per cent. more money than in 1882, though in 1882 its expenses were larger than ever before. The report says that the increase was mainly due to the cost of rebuilding engines and an outlay of $91,465 on new shops at Columbus, from which we may infer that more than the average was expended for maintenance last, and less than the average in previous years. Since 1880, with an increase of 11 per cent. in traffic, there has been an increase of 7 per cent. in gross earnings and of 34.8 per cent. in working expenses, so that the net earnings have *decreased* from $2,032,682 to $1,536,275, or 24.4 per cent.

The report charges the larger rate of increase in expenses to the passenger traffic, making the cost per passenger per mile 2.16 cents last year against 1.63 cents in 1880, an increase of 32½ per cent., causing a decrease from 0.75 to 0.44 cent in the profit per passenger-mile, according to which the passenger profit was but $177,760 in 1883 against $272,750 in 1880.

The expense per ton per mile, meanwhile, increased from 0.44 cent in 1880 to 0.52 cent last year, or 18 per cent., leaving the profit 0.40 cent in 1880 and 0.24 cent last year, which makes the net earnings from freight $1,027,920 last year against $1,540,800 in 1880. But by this method of charging expenses, the whole is covered by these two traffics, and nothing is charged to mails, express, etc., and there is an increase of $544,000 in the expenses due to the greater cost of handling the same amount of business, and of only $252,000 due to the larger traffic.

The increase in the freight traffic after 1880 was very nearly offset by the decrease in the rate, so that there was an increase of but $26,000 in the freight earnings, but the increase of 11 per cent. in the passenger earnings was supplemented by an increase of

9¼ per cent. in the passenger rate, resulting in an increase of no less than $187,795 (21¾ per cent.) in the passenger earnings. Thus there is a marked difference in the course of the returns from the two kinds of traffic, though in amount they have kept even pace. The growth in passenger earnings and an increase of $86,000 in miscellaneous earnings are what has chiefly offset the increase of $796,740 in working expenses.

There was the very great increase of 15 per cent. in the mileage of passenger trains last year over 1882, made to accommodate an increase of but 2¼ per cent. in the passenger mileage, the average passenger train load having decreased from 48¼ to 43 passengers, and the increase of 11 per cent. in passenger traffic since 1880 has been accompanied by an increase of no less than 43 per cent. in the passenger-train mileage, the train-load having decreased from 51 to 43; the increase of 11 per cent. in freight traffic, however, has required an increase of but 15 per cent. in train mileage, the freight-train load having decreased from 165¼ to 160¼ tons.

The New York, Chicago & St. Louis Railway Company reports to the New York Railroad Commissioners for the first quarter of this year that its gross earnings were $804,886 ($1,542 per mile) and the working expenses and taxes $574,148 (71⅓ per cent.), leaving $230,738 of net earnings; meanwhile the interest accruing was $314,979, and the rentals $1,253, so that there was a deficit of $85,494. The balance sheet shows besides the $15,000,000 of first-mortgage bonds and $4,000,000 of equipment bonds only $703,000 of the $10,000,000 of second-mortgage bonds that have been authorized, but the amount of $2,669,798 of loans and bills payable. The company has probably found it cheaper to borrow money temporarily than to sell the second-mortgage bonds at the prices that could have been obtained for them.

It is somewhat surprising to find that the expenses were so small in proportion of the earnings, considering that the road's business is chiefly through freight, and that the deficit was so small an amount as $85,494. The road had a large traffic, however, in the first quarter of the year, carrying nearly one-eighth of the total through shipments from Chicago—almost as much as the Michigan Central, which, until within a year, has been the largest carrier of freight from Chicago. If it obtained a corresponding proportion of the west-bound freight, it must have obtained a very large share of its profits from that, for rates were well maintained. And though they were not well maintained on east-bound freight, they were still on the average probably more than 20 cents per 100 lbs., whereas for the first two months of the second quarter they have been but 15 cents. The shipments have been so much greater since March that the gross earnings may be maintained for the second quarter, but we should expect a very poor showing of net earnings then.

Fast Train Records.

A correspondent sends us records, copied below, of the speed from mile-post to mile-post, taken with the independent second hand of an ordinary stop watch, of a run of the fast train from Philadelphia to New York over the Bound Brook Route and of a run of the corresponding fast train over the Pennsylvania Railroad in the opposite direction. The record was taken without assistance, but our correspondent believes it to be very nearly exact. Where the time is not given to any mile-post, it is because it was hidden from sight. Elsewhere the minutes and seconds given opposite any mile-post are the time taken in running from the preceding post:

Record of speed of Bound Brook Route Train No. 505, Philadelphia to New York, Friday, May 9th, 1884.

Train left station at Ninth and Green streets, Philadelphia, at 7:30 a. m. and reached Jersey City at 9:23 a. m. Train consisted of four cars drawn from Philadelphia to Bound Brook by Wooten fast passenger locomotive No. 364, Philadelphia & Reading Railroad, and from Bound Brook to Jersey City by Baldwin engine No. 169, Central Railroad of New Jersey:

Mile-post.	Time. Min.	Sec.	Mile-post.	Time. Min.	Sec.	Mile-post.	Time. Min.	Sec.
85			56	1	22	28	1	13
84	1	29	55	1	12	27	1	02
83	1	31	54	1	05	26		58
82	1	34	53		58	25		57
81	1	11	52		55	24		59
80	1	00	51		55	23	1	00
79	1	36	50		56	22		55
78	1	00	49	1	06	21	1	00
77		57	48	1	00	20		56
76		54	47		52	19	1	00
75		49	46		52	18		50
74		53	45		47	17		48
73		53	44		46	16		47
72		57	43		47	15		48
71		52	42		47	14		50
70		52	41		48	15		50
69 *	2	03	40		48	12	1	08
68			39		48	11	2	04
67	1	02	38		49	10	1	20
66	1	00	37		47	9	1	05
65	1	00	36		48	8	1	17
64	1	03	35		50	7	2	05
63		57	34		50	6	1	20
62		56	33	1	38	5	1	03
61		51	32	1	40	4		57
60		49	31	1	27	3		53
59 †		15	30			2	1	07
58 †	3		29	1	20	1	1	10
57	‡3	18				J. C	2	30

*Long Bridge. †Delaware River Bridge. ‡Trenton.

Record of Speed of Train No. 19, New York Division Pennsylvania Railroad, Wednesday, April 30, 1884.

Train left Jersey City at 4:18 p. m., and arrived at Broad street station, Philadelphia, 6:05 p. m. Train consisted of four cars drawn by Pennsylvania Railroad fast passenger engine No. 1,070, 6 ft. 8 in. wheels.

Mile-post.	Time. Min.	Sec.	Mile-post.	Time. Min.	Sec.	Mile-post.	Time. Min.	Sec.
1			30		53	58	1	45
2			31	1	00	59	1	15
3	3	10	32	1	00	60	1	06
4			33	1	05	61	1	04
5			34	1	02	62	1	00
6 *	10	2	35	1	06	63		57
7			36	1	00	64		55
8			37		55	65	1	00
9			38		57	66		59
10	4	50	39		55	67	1	05
11			40		52	68	1	11
12	1	00	41		53	69	1	05
13	1	00	42	1	10	70	1	03
14	1	08	43	1	10	71	1	04
15	1	37	44	1	00	72	1	02
16	1	13	45		58	73	1	01
17	1	03	46		56	74		59
18	1	05	47		56	75	1	03
19	1	11	48		58	76	1	03
20	1	03	49	1	00	77		59
21		58	50	1	00	78	1	00
22	1	00	51	1	00	79		58
23	1	03	52		59	80		55
24	1	05	53		56	81	1	00
25	1	04	54		57	82‡	2	33
26	1	00	55		56	83	1	43
27	1	00	56	4	30	84	1	57
28		57	57 †			85	1	30
29		55						

*Held 4 minutes at draw-bridge. †Trenton. ‡Stopped at block.

This shows the Wooten engine to have made exceptionally fast time on two stretches, first for the eight miles from mile-post 78 to mile-post 70, which it ran in 427 seconds, which is at the average rate of 53⅗ seconds per mile, or 65.6 miles per hour, and next for the 14 miles from mile-post 48 to mile-post 34, which it ran in 679 seconds, and at the average rate of 48½ seconds per mile, or 74.2 miles per hour, taking no more than 50 seconds for any mile of the 14. At this rate the distance from New York to Chicago would be passed in 12 hours and 18 minutes, and the distance from New York to San Francisco in 44 hours.

The Baldwin engine made 14 miles, from mile-post 27 to mile-post 13, in 758 seconds, an average of 54.14 seconds per mile, or at the rate of 67½ miles per hour, never taking more than a minute for a mile. The quickest mile was by the Wooten engine, in 46 seconds, but the Baldwin engine made a mile in 47 seconds.

The quickest mile by the Pennsylvania engine was in 52 seconds.

The narrow gauge is being deserted by its friends if we may judge from an interview with Mr. J. O. Arnold, of Columbus, O., who has been somewhat prominent as a narrow-gauge builder and who is reported in the New York *Tribune* to say:

"Narrow-gauge railroads have proved a failure in many of the Western states because the standard gauge has become so firmly established in this country. I suppose the narrow gauge will gradually disappear in the same manner as the broad 6-ft. gauge has or as the broad gauge, so generally in use throughout the South a few years ago, is disappearing. But the narrow gauge has especial advantages in mountainous districts such as that which the Denver & Rio Grande traverses, which will always maintain it there. The comparative cheapness with which a narrow-gauge road may be built and maintained for local travel has caused the construction of miles of railroads that would otherwise never have been built. It has been an important agent in opening the interior of Ohio, Indiana and Illinois and many of the lines have since been changed to the standard gauge. The Toledo, Cincinnati & St. Louis system of more than 500 miles is now about to go through this change to accommodate through business, but this line would not have been in existence now but for the narrow gauge."

Thus the position which this journal has always taken is being daily made clearer, that the narrow gauge had no advantage to justify its existence except that it makes it easier to coax money for construction out of men with more money than knowledge of railroads. The only untrue part of the above note is that the narrow gauge has been of any measurable advantage, even in Colorado. It is extraordinary how this argument is clung to when it ought to be perfectly evident from what has been done elsewhere, that the rails as they now exist in Colorado may be moved out to standard gauge on the existing ties and road-bed, and operated with equal ease and safety by rolling-stock of the same weight, cost, power and capacity; for the gain in some ways from being of standard gauge will balance the slight percentage of loss of weight in a few of the parts. This of course does not include the immense advantage of being able to exchange rolling stock with other lines without breaking bulk, which would be a net gain.

The through and local shipments eastward of flour, grain and provisions from Chicago for the week ending May 31, were 52,218 tons, against 22,348 tons in the corresponding week of last year, and 52,675 tons in the previous week of this year. For six successive weeks these shipments, in tons, and the percentages carried by each road, have been:

	Week ending— April 26.	May 3.	May 10.	May 17.	May 24.	May 31.
Flour	11,561	10,024	9,412	7,877	6,914	5,922
Grain	51,242	44,575	36,603	32,376	37,327	37,905
Provisions	5,096	6,735	7,583	6,678	8,434	8,391
	67,899	61,355	53,598	46,931	52,675	52,218
P. c. by						
C. & Grand T.	10.6	17.1	14.7	20.9	25.3	15.0
Mich. Cen	11.1	10.9	12 8	11.0	14.4	12 9
Lake Shore	12	14.3	16.0	16.7	13.9	18.1
Nickel Plate	10 6	9.6	12.6	11 9	10.2	10.8
Ft. Wayne	13.2	17.2	18.9	14.2	12.4	16.3
C., St. L. & P.	9.8	9 2	8 2	7.8	5.5	9.1
Balt. & Ohio	10.4	9.8	7.6	8.6	9.6	9.3
Ch. & Atlantic	21.9	11.9	9 2	8.9	8.7	8.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

The above is no criterion of the distribution of the pooled shipments, but it indicates how the business of the different roads has fluctuated from week to week.

The shipments continue remarkably large for the season, chiefly because the rates are so low that the railroads carry much of the grain which usually goes by lake. But the flour and provision shipments are also much larger than usual.

An effort was made to advance lake rates about two weeks ago, which was partly successful. Rates had ruled 1¾ cents a bushel for corn and 2 cents for wheat from Chicago to Buffalo, and a few cargoes were taken for ¼ cent less when this effort was made. For a time vessel owners held out for 2 and 2¼ cents, and a little was carried at those rates, but last week the rates fell again to 1¾ and 2, and it was not easy to get cargoes at those rates. Monday the vessels accepted 1⅝ for corn and 1¾ for wheat, and through rates to New York were 5 cents for corn and 5⅝ for wheat. The carriers of ore are faring about as badly, getting not more than 90 cents a ton from Escanaba to Cleveland; otherwise the grain vessels would go into the ore trade. The rates on coal from Buffalo to Chicago are more satisfactory, about 80 cents a ton, which makes a cargo of coal up yield more than one of grain down. The ore vessels usually get no cargo up. The offerings at Chicago have been so small lately that a large propeller is said to have cleared Chicago for Buffalo light this week, which probably never occurred before.

A new hyperbolic statement of the lowness of freight has been invented, which is perhaps intended to be a superlative of the familiar statement that the freight "doesn't pay for greasing the wheels." A newspaper correspondent on Lake Superior, commenting on the immense shipments of flour over the St. Paul & Omaha road from Minneapolis to Washburn, says: "Reports say that the Omaha people are carrying flour so cheaply now that it would take ten trains to pay a brakeman's wages for one day."

The Wabash withdrew May 24 from the Central Iowa Traffic Association, and May 29 it made an open cut in the rates between Des Moines and St. Louis, Chicago and Milwaukee. The Wabash has perhaps more power over rates than any other one railroad in the country. East of the Mississippi it has to charge trunk-line rates, that is, rates based on the New York-Chicago rates, on a vast proportion of its freight, at least cannot charge more: but west of the Mississippi its lines compete with a large number of railroads between Chicago and St. Louis on the one hand and the Missouri River on the other, which have been able to collect much more than trunk-line rates, and are prosperous because they do, and a vast deal of damage is possible there.

The Transcontinental Association dies almost as soon as it is born, if, as the telegraph says, the Atchison, Topeka & Santa Fe has given notice of withdrawal.

Large sales of land by the Union Pacific to ranchmen are reported, no less than 276,143 acres having been disposed of in five days recently, while the sales from Jan. 1 to May 20 were 1,459,703 acres, for $3,542,058, an average of $2.46 per acre. This is nearly one-ninth of all the land owned by the company at the beginning of the year, and vastly more than the sales in the whole of any previous year have been.

The sales for three years have been:

	1881.	1882.	1883.	Jan. 1 to May 20, 1884.
Acres	141,387	398,074	1,166,349	1,459,703
Amount	$654,775	$1,772,296	$4,081,134	$3,542,058
Per acre	$4.63	$4.45	$3.50	$2.46

There is always a considerable number of sales cancelled every year, but the above represents the transactions. The secret of the recent large sales is that the ranchmen are beginning to buy the land where they have been grazing their cattle for years. This is a very important movement for the Union Pacific, and may be later for the Northern Pacific. The Union Pacific's land is now chiefly grazing land on the plains or mountains, and until recently it seemed absolutely unsalable. A small price will cause it to yield a large sum.

Mr. John M. Goodwin, C. E., has invented a new profile paper made of linen bond-paper, which is new in being ruled instead of engraved, and in being partly transparent. A sample under inspection is made of two thicknesses of very thin paper, joined together with the ruling on the inside of one of them. An advantage in this mode of construction—and a great one—is that lines can be erased without erasing the horizontal and vertical lines. Nevertheless, for the construction of original profiles no very great advantage over the ordinary profile paper is obtained. The great desideratum, and one which it is surprising that no manufacturer has attempted to supply, is a *tracing* profile paper or cloth, on which profiles can be readily copied without the great labor of drawing in the horizontals and verticals. The demand for such paper—or, much better, cloth—would, as compared with what now exists for printed profile paper, be very great. The labor of copying a profile would then be so small that probably two or three copies would be made, both for the use of the road and for private preservation where one is now, and the saving in draughtsmen's time would be very great. To attain its maximum convenience the paper should be folded in WW form and not rolled. Mr. Goodwin's ruled paper shows that there is no insuperable difficulty in ruling tracing cloth in the same fashion, and the manufacturer who has the shrewdness to do it will find it a profitable specialty.

The Denver & Rio Grande Railway tests all pipe work, safety valves, gauges, etc., by air pressure, as well as new or newly repaired locomotives themselves, before firing them up and subjecting them to test under steam. For this pur-

pose two Westinghouse air-pumps with reservoir are kept at work in its shops at Denver, and when an engine is ready to come out of the shop the boiler is filled with air at 60 lbs. pressure, enabling the engine to move itself out and furnishing a rough test of its condition before it is fired up at all.

This recalls by association an anecdote of the late Zerah Colborn, when a boy in a shop, which furnished early proof of the fertile and ingenious mind which afterward did so much for the progress of mechanics. He made a bet with a number of the older hands that he would run a certain new locomotive a mile, just as she stood, without either steam, water, or fire in the boiler. To win and fulfill his bet he caused the dead engine to be towed out to a certain spot a mile or two off, on pretense that the track was there more suitable, having stipulated that no one but himself should ride on the engine. By keeping the reverse-lever of his dead engine in the last notch back while being towed out, the cylinders, of course, acted as air-pumps and stored sufficient compressed air in the empty boiler to enable him to move off triumphantly on being "cast loose," and he easily accomplished the feat.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Illinois Central.—The *Canton, Aberdeen & Nashville Branch* is extended east by north to Starkville, Miss., 9 miles.

Ohio River.—Track laid from Powhatan, W. Va., southward 18 miles.

A credit of 30 miles of track was given to the *Northern Pacific* in our number for May 9. We are now informed that the track in question was laid in 1883, and the 30 miles are accordingly deducted from the figures for this year.

This is a total of 27 miles of new railroad, making (with the deduction noted above) 910 miles reported to date for th current year. The total track reported laid to the corres ponding date for 12 years past, is as follows:

	Miles.		Miles.
1884	910	1878	413
1883	1,654	1877	570
1882	3,323	1876	628
1881	1,754	1875	596
1880	1,590	1874	537
1879	661	1873	1,171

These statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

Notes at Pittsburgh.

THE KEYSTONE BRIDGE WORKS.

The Keystone Bridge Company is extending its shops at Pittsburgh, and putting in additional tools and machinery. The erecting shop for heavy bridge work is to be lengthened, and a new foundry and new shop for plate-girders built. The latter will be provided with an overhead power traveling crane, worked by a shaft running the length of the shop. A Yale & Towne traveling crane is in use in the yard shifting plates. An additional building is also being provided for use as a foreman's office below and drafting room above.

The increased use of steel in bridge construction has led to the adoption of new tools and appliances specially adapted to deal with this material. Eye-bars have been made of steel and tested with very satisfactory results, which are believed to be mainly due to the mode of manufacture adopted. The plain bars are upset at the ends and then stamped to the proper form in a die under a steam hammer especially constructed for stamping, the tup being guided to within a few inches of the work. The bars, when shaped, are then placed completely within an annealing furnace 54 ft. long, and after being heated by gas are allowed to cool gradually. The whole of the bars of one length are then brought into the machine shop and are left on the floor a sufficient length of time to acquire the temperature of the shop. The end holes are then roughly drilled, and are finally drilled to the proper size and distance apart on a special machine for that purpose, having movable boring heads upon a long bed. The correct position of all holes is obtained from wooden templates made in the pattern shop. The holes in the links are drilled about $\frac{1}{16}$ inch larger than the diameter of the pins. It is, of course, most important that all the links between two given points should be of exactly the same length, as a small deviation will throw initial strains on the links. Errors in length are often produced by the effect of temperature; one link may be drilled after it has acquired the temperature of a warm shop, while its neighbor may be drilled at a far lower temperature, having been brought to the drilling machine straight from the yard. This source of error is avoided in the manner above described.

Two 60-ft. turn-tables are being built for the Pennsylvania Railroad. The top and bottom chords are each composed of two angle irons running the entire length of the turn-table. The only plate used on the lower chord runs for about 20 ft. in the centre of the girder. The table is supported on the centre by a number of coned rollers running between two plates of corresponding form.

The Keystone Bridge Company is now engaged in making the iron work for two railroad bridges of the largest size. One across the Ohio, at Henderson, Ky., has a centre span of 525 ft., the largest span yet used for a truss. This span is a single triangulation truss 56 ft. deep. The side spans are upon a gradient rising toward the centre span at the rate of 84 ft. to the mile. The principal parts of the centre span will be made of steel, iron being retained for lateral bracing, etc. The floor bearers are suspended by means of an arrangement of equalizing levers which permits them to be unequally deflected without bending the posts.

Another large bridge is that by which the Baltimore & Ohio Railroad will cross the Susquehanna near Port Deposit, on its new line between Baltimore and Philadelphia. It is said that when completed it will be the longest railroad bridge in this country. The total length is 6,830 ft., or over 1¼ miles, but 2,480 ft. of the length is iron trestle over a low island, which at this point divides the river into two branches. The trestle work (as previously stated in the *Railroad Gazette*) will be built in the Mount Clare bridge shops of the railroad company. The widest channel will be crossed by a main through span of 520 ft., Pratt truss, double intersection, with pin in centre, the top chord being curved in side elevation. Next to this through span are three deck spans of 480 ft. The narrower channel (which, however, demands deeper foundations, the rock being about 100 ft. below low-water mark) is crossed by a deck span of 520 ft. span, and several smaller spans. In all the bridge is composed of

1 through span, 520 ft.	520 ft.
1 deck span, 520 ft	520 "
5 " " 480 "	2,400 "
1 " " 380 "	380 "
1 through span, 380 ft.	380 "
1 deck span, 200 ft	200 "
Trestle	2,430 "
Total length	6,830 ft.

Few bridges have two spans each exceeding 450 feet, and probably the St. Louis Bridge stands alone in having three spans each exceeding 500 ft. In the Susquehanna bridge, however, it is somewhat remarkable that though the spans are similar in length, 520 ft., the forms of the girders are radically different.

Trial borings have shown that the depth of mud in the middle of the channels varies from 50 to 78 ft., and it will therefore be by no means an easy task to secure a good foundation for these large spans.

About 5,000 tons of iron and steel will be required for the bridge proper, excluding the trestle work. Steel will be largely used in the principal parts of the main spans. The connection of the floor bearers and lateral bracing has been specially designed to transmit the strain of the latter directly and fairly to the pins of the main truss without setting up any unfair bending or secondary strains.

STEEL FIRE-BOX PLATES.

Messrs. Shoenberger of Pittsburgh are well known as makers of steel plates for locomotive boilers and fire-boxes. The plant embracing blast furnaces, Siemens-Martin converters and rolling mills, the whole of the various processes of making the finished plates from the ore are carried on in the works. Various foreign and domestic ores are used, Elba, Algeria, Bilboa and Lake Superior contributing ores which are mixed with Cumberland hematites in order to produce satisfactory pig as free as possible from phosphorus. The iron blooms made from this pig contain only from $\frac{3}{1000}$ to $\frac{5}{1000}$ of one per cent. of phosphorus. The blooms are then converted into steel ingots by means of the Siemens-Martin process, and these ingots, after reheating, are rolled into plates.

The great aim is to secure an even quality of material with a minimum quantity of phosphorus, and it is considered that the process above indicated best secures these results, and that the plates are uniformly soft and ductile and are free from the hard spots sometimes found in plates made by the Bessemer process. Scrap steel is not used in the Siemens converters, as it generally contains too much phosphorus. The fire-box plates yield the following analysis:

	Per cent.
Phosphorus	0.012 to 0.025
Manganese	0.300
Silicon	0.020

The total impurities are thus only about $\frac{1}{8}$ of 1 per cent., if the manganese be regarded as an impurity and not an essential constituent of steel. When subjected to a physical test the plates stretch about 20 per cent. in a length of 8 in. before breaking.

The plate mill is one of the largest in this country, and is only surpassed in size by a mill now under construction by McIntosh, Hemphill & Co. for Messrs. Park Bros. Messrs. Shoenberger's mill, however, can roll a plate 105 in. wide, the rolls being 110 in. in length, and 31 in. in diameter. The rolls are three high, non-reversing, driven by a Corliss engine, and the plates are fed into and received from the rolls by rising and falling tables, the surfaces of which are provided with a series of rollers on which the plate rests. The rollers, being driven by level gearing, feed the plate into the rolls. The rolls are brought closer together after each pass by means of a large hand wheel actuating screws, which prevent the rolls rising above a certain point when forced upward by the resistance of the plate being rolled. When the plate has passed through the rolls they naturally fall, and the "roller," or man in charge of the operation, has only to overcome the friction of the screw when he adjusts the rolls. The screw is connected by multiplying gear to a large drum, the surface of which is marked with various cabalistic signs, showing on an exaggerated scale the exact thickness of plate produced at any given position of the hand-wheel and screw. The roller can thus adjust the rolls so that an equal reduction of thickness of the plate takes place at each pass, and, what is more important, can adjust the rolls at the last pass so as to give accurately the proper thickness to the finished plate. The engine and housings for the rolls were made by Messrs. McIntosh, Hemphill & Co., and the rolls themselves by Messrs. Jarrison & Co., both Pittsburgh firms.

The plates are sheared in a massive shearing machine capable of dealing with a plate 100 in. wide. The machine has a long knife or shear blade held by a massive casting sliding on two standards, and forced down to its work by a pair of eccentric and sliding blocks. It is driven by an independent engine, and was made by Messrs. Morgan, Williams & Co., of Alliance, Ohio.

Some of the plates produced by Messrs. Shoenberger are ultimately made into a most excellent quality of steel nails. The plates being cut into small pieces, the width of which a trifle exceeds the length of the nail, the latter are sheared off the end of the plate and headed at one operation. The even texture and ductility of the steel renders it especially suitable for this work, as it does not tear and split like wrought iron when subjected to the same treatment. The nails appear to be remarkably uniform in size and shape, and will bear being bent round sharply without showing a sign of a crack.

THE PITTSBURGH JUNCTION RAILROAD.

Rapid progress is being made with this important link, which will join many of the independent lines around Pittsburgh, and especially connect the Pittsburgh & Western, and the Baltimore & Ohio railroads, giving the latter a through route to Chicago, *via* Pittsburgh. The Pittsburgh & Western has already commenced running a through express train between Pittsburgh and Chicago.

The line, after leaving the Baltimore & Ohio, passes, by a tunnel 3,000 ft. long, under the ridge on which the eastern part of the city of Pittsburgh is built. The tunnel runs through clay and soft slate, and has been excavated in the old-fashioned way, chiefly by hand labor, power or diamond drills being of little use in the soft stuff met with. On emerging from the north end of the tunnel, the line passes under the Pennsylvania Railroad, between Millvale and Lawrenceville stations. It then crosses the Allegheny River to form a junction with the Pittsburgh & Western. The part of the bridge crossing the river itself presents no features of special interest, as the line is straight, but the bridge across the backwater on the Allegheny City side is on the skew, and accommodates a double line of rails laid to a 7 degree curve. The span of the bridge is 218 ft., and the horizontal distance between the centres of the chords is no less than 36 ft. 6 in., this increase over the ordinary width being necessary in order to allow for the sharp curve.

The bridge is being built at the works of Messrs. C. J. Schultz & Co., at Chartiers, a few miles below Pittsburgh.

Australian Railroad Notes.

The information below is nearly all obtained from a communication to the *Zeitung des Vereins Deutscher Eisenbahn-Verwaltungen*, by Mr. Henry Greffarth.

In Australia at the close of 1882 and 1883 the length of railroad in operation was:

	1882.	1883.	Increase.
Victoria	1,507	1,355	152
New South Wales	1,461½	1,315	146½
South Australia	998½	945½	53
Queensland	1,020	898	122
West Australia	92½	92½	....
Tasmania	172	172	....
New Zealand	1,430	1,370	60
Total	6,680½	6,155	525½

Compared with the population the increase was much greater than in the United States during 1883, our increase having been about 6,900 miles for 54½ million people; their's 525 miles for 3 million people. The Australians built one mile of railroad for every 5,700 people, we one for every 8,000 people; but in 1882 we built a mile for every 4,600 people.

The gauges of the railroads in Australia are as follows: In Victoria, 5 ft. 3 in.; in New South Wales, 4 ft. 8½ in.; in South Australia, 5 ft. 3 in. and 3 ft. 6 in.; in Queensland and West Australia and New Zealand, 3 ft. 6 in.; in Tasmania, 5 ft. 3 in. and 3 ft. 6 in.

The Australian colonies import nearly all their railroad materials, and chiefly from England, but also buy some things in this country. The contracts are let through their agents in London, whose names and addresses are:

Victoria.—Mr. Robert Murray Smith, No. 8 Victoria Chambers, Victoria street, Westminster.

New South Wales.—Sir Saul Samuel, K. C. M. G., No. 5 Victoria Chambers, Westminster.

South Australia.—Sir Arthur Blyth, K. C. M. G., No. 8 Victoria Chambers, Westminster.

Queensland.—Mr. William Hemmant, No. 1 Westminster Chambers, Victoria street, Westminster.

New Zealand.—Sir Samuel Dillon Bell, K. C. M. G., No. 7 Westminster Chambers, Westminster.

Victoria, the colony in the extreme southeast of Australia, having 87,540 square miles of area (—Indiana and Illinois together) and 910,375 inhabitants (85,000 less than Kansas in 1880) had 1,355 miles of railroad at the end of 1882, which earned £1,781,078 gross and £382,479 net in 1882, which is equal to $6,397 gross and $2,448 net per mile of road—not far from the average in the United States, which was $7,188 gross and $2,899 net in the last year reported. The Victorian railroads yielded net but 3½ per cent. on the capital; the American railroads 4¼ per cent. The average cost per mile of the Victorian railroads was $70,422, while ours cost $61,342. Victoria had a population of 910,375, and its population per mile of railroad was 672, while ours was 480. It is thought that Victoria has made extraordinary progress in providing railroads, which has been done entirely by the government, which had to pay for interest on the railroad debt in 1882 $930,000 more than the net earnings of the railroads, though it pays only 4¼ per cent. interest on the debt. Taking the country as a whole and the probable future value of the railroads, this is probably a light tax (in addition to the sums paid for freights and fares) to pay for their advantages. It amounts to about $1 per head of population. The dividends paid by American railroads amounted to $1.87 per person. The total net earnings, which are what is paid by the community for interest on the investment in railroads, was $3.65 per person in

Victoria and $5.71 here. But as there is 40 per cent. more road for each American than for each Victorian, it is natural that the cost should be greater to the former, as much so as that the man who keeps three horses should have to spend more for horses than the man who keeps two; but the cost was somewhat greater than the accommodation here, being 55 per cent. more per person.

The Victorian railroads are of 5 ft. 3 in. gauge.

In 1882 the colony of Victoria was required by the courts to pay $600,490 to persons injured by accidents on the State railroads, of which it had 1,355 miles. This sum was 17 per cent of the total net earnings of its railroads. Most of these accidents were on one comparatively short line, and the payments for injuries exceeded the net earnings of this line by about $125,000.

New South Wales, the colony adjoining Victoria on the north (on the east coast of Australia), has an area of 308,000 square miles, and, in 1882, had 817,468 inhabitants and 1,315 miles of railroad, whose average cost had been $60,807 per mile. Their gross earnings in 1882 were £1,658,864; their net earnings, £764,229, which is equivalent to $7,388 gross and $4,064 net per mile—$200 more gross and $1,165 more net than the earnings of railroads in this country. The net earnings were 5 1-6 per cent. on the capital expended—an eminently satisfactory result, as the interest paid by the government is less than that. The government had authorized the expenditure of £11,000,000 more for railroad construction, of which £3,000,000 was negotiated last year. This is the only Australian colony that has adopted the English and American standard gauge of 4 ft. 8½ in. A connection with the Victorian railroads is almost completed, and one with Queensland, the colony next north, is in progress.

Queensland, next north of New South Wales, has but one-fourth of its population (248,255 in 1882, which is 54,000 more than Colorado had in 1880), but more than twice its area (690,000 square miles, which is 2⅕ times Texas), had 898 miles of railroad in operation at the close of 1882, which was at the rate of one mile to 296 inhabitants. The colony devotes large sums yearly to the importation of immigrants and the construction of railroads, and 30,000 immigrants arrived last year. The average cost of its roads has been but $33,840 per mile, one of them having cost but $19,300 per mile. In 1882 they earned £464,160 gross and £222,029 net = $2,516 gross and $1,202 net per mile. The latter small sum amounted to 3.55 per cent. on the cost of the roads. Queensland is all north of the 30th degree of south latitude, and mostly in the tropic zone; but the population is inconsiderable north of the 19th degree. Only the southern half of Florida is in as low a latitude as the part of Queensland most distant from the Equator, and some of the Queensland railroads are about in the latitude of Cuba. Grazing and mining are the leading industries, but there is some sugar-growing near the coast. The Queensland government in 1882 made a provisional contract for the construction of two long railroads (over a thousand miles in all) across the colony, for a land grant of 10,000 to 12,000 acres per mile; but the Parliament refused to indorse this agreement, and when the ministry dissolved the Parliament and "went before the country" on this question, the new Parliament rejected the proposition by a still greater majority, and voted that the colony should borrow money to build the railroads required rather than make large grants of land to induce corporations to build them.

The experience of the Australian colonies in building and working state railroads should be watched with interest as an experiment of people whose character, customs and laws are much more like ours than those of the European countries which have state railroads. These colonies are in a position to profit greatly by extending their railroads. They own vast areas of land, and get a very large part of the benefit of the advance in the market value of land which follows the construction of railroads which make it accessible. This increase in value in many of our states has probably been many times the entire cost of the railroads, but the railroads have got none of this increase, the states (which may be compared with the Australian colonies) none, the general government comparatively nothing (as it gives away most of its land and sells very little), but the individual land-owners nearly the whole.

All the Queensland railroads are of 3 ft. 6 in. gauge. Trains run over them at from 16 to 20 miles an hour.

South Australia is the colony next west of those above named, extending entirely across the continent from the south to the north coast, with the enormous area of 935,000 square miles, most of which has scarcely ever been trod by the foot of man. Its population was 310,650 at the close of 1883, which was 311 per mile of railroad. The expenditure on railroads per inhabitant was only $103, the average cost per mile of the 945½ miles at the end of 1882 having been but $32,600. Small as it was, however, the net earnings were but 2.56 per cent. on this capital, and the balance had to be made up by taxation. Several of the roads did not earn their working expenses.

West Australia, with but 30,766 inhabitants (but an area of 1,009,000 square miles, which is more than that of the whole United States east of the Mississippi) has 92½ miles of railroad, or a mile to 333 people. But it does not support its railroads. There are two roads—one 24 and one 12 miles long—owned by companies and engaged in carrying timber to the coast, which may be presumed to earn some profit, else they would not be worked; but neither of the two roads owned by the government earned its working expenses.

This colony remained a penal colony until 1868, and it seems to have scarcely any fertile land along the coast; but not long ago an explorer discovered a comparatively fertile district some 200 miles inland, and the colony now hopes to secure a considerable construction of railroads through land grants, for which London syndicates have been negotiating. No part of the United States except Alaska is so thinly populated.

THE SCRAP HEAP.

Running Away from a Runaway.

A dispatch from Rock Island, Ill., May 29, says: "A curious and very nearly a disastrous collision occurred on the Rock Island & Peoria road to-day. The engine of a gravel train got off the track near Coal Valley, a station about 14 miles from here. A wrecking train was sent out from Galva to get the engines on the track again. Passenger train No. 2, going to Peoria from this city, met the disabled engine first, and after considerable work the track was cleared. The train then started on, but had not gone far when the wrecking train, the engine to which was backing up, was met on a sharp curve. Both engines were reversed as quickly as possible, but the trains came together with quite a shock. The passengers were badly shaken up but no one was seriously hurt. The engineer and fireman of the engine attached to the wrecking train had jumped to the ground, and when the collision occurred the tank became detached, while the rest of the engine started forward at a terrific rate, the engineer having pulled the throttle wide open before he jumped. Passenger train, No. 1, from Peoria, was about due as the wild engine started down the track directly toward it. Both engines, however, approached on a straight track, and the engineer on the passenger train reversed his engine and started on the back track, closely followed by the wild engine. The chase was kept up for several miles until the steam finally gave out on the runaway engine and it was captured. Thus two narrow escapes from a fearful collision occurred in a short space of time."

A Tunnel Accident.

A dispatch from Ligonier, Pa., May 29, says: Knupp's Tunnel on the South Pennsylvania Railroad was the scene of a terrible accident by which 9 men were instantly killed and eleven others severely injured, with slight hopes of recovery. A large force of men was engaged in excavating a tunnel about 100 ft. from the main entrance when the heavy scaffolding gave way with the above appalling result. Your correspondent was unable to learn the names of the victims, but it is said they were principally Italians. The bodies have been recovered and a coroner's inquest will be held. Great excitement prevails at the scene of the disaster.

"The underground work of the tunnel was just begun yesterday, and they had not made much progress when the accident occurred. The coverings were limestone, and the roof was timbered over as the work progressed. It was thought to be secure, but the rocky sides and covering split and came down with such force as to crush the heavy timbers and precipitate a huge mass of earth on the unfortunate men below. All the available force were put to work at once digging out the crushed remains of the victims. The scene is described as heartrending, as one after another of the mangled bodies were brought out and laid on the bank. Six were killed outright, and two have since died. Five others were seriously injured. The men killed were all foreigners with one exception. Their names could not be learned, as the tunnel is 20 miles from any railroad."

A Narrow Escape.

Train No. 5 on the Erie had a narrow escape from a bad accident Wednesday night, at the Black Rock cut just east of this village. The watchman, who is kept constantly on duty at this point, heard an unusual noise shortly before 9 o'clock, and going outside discovered that two large Western Union telegraph poles, together with all the wires, had fallen directly across the track. Knowing that the St. Louis express was about due, he hurried down the track and flagged the train just as it was about to enter the cut. The track at this point runs along the edge of a high embankment, and had the train ran into the obstruction, it would probably have been thrown from the track and many lives jeopardized. It took an hour to remove the poles and wires, and telegraph communication was delayed nearly all night over some wires.—*Port Jervis (N. Y.) Gazette, May 29.*

Baggage Express Agents.

The New York *Times* charges that some of the baggage express agents on the railroads running into New York are in league with confidence men and other swindlers, and make use of the opportunities given by their business to get information as to the destination, business and names of travelers, which they promptly give to their confederates. This charge ought to be investigated.

Train Robbers in Mexico.

The *Mexican Financier*, of May 24, says: "The Government is showing commendable energy in prosecuting the suppression of lawlessness in the bandit-infested district along the line of the Mexican Central Railway in the states of Querétaro and Guanajuato. Since the attack on the train at kilometer 258 a force of 800 cavalry has been scouring the country under General Piñon, protecting the railway and arresting evil-doers. It is the determination of the Government not to cease its exertions until not only are all the train-wreckers cleared out of the way, but the country is rid of all evil-disposed persons and suspicious characters. The effect is already most beneficial. There is a feeling of wholesome terror inspired among the mischievously inclined peasantry, and nobody ventures to be seen near the railway for fear of arrest and death, or the fate of being sent to Yucatan, which in their eyes is worse than being shot. Therefore trains now run on time and without molestation, the track being free from obstacles. The local authorities have shown themselves lukewarm in aiding the troops to bring the offenders to justice, therefore the latter have taken the matter entirely into their own hands. The owners of haciendas are largely to blame for this, for in order to secure themselves against robbery many of them compromised with the bandits, assuring them protection against the consequences of their deeds when they were arrested, and therefore interceding with their influence before the local magistrates. The greater part of the train-wreckers have now been arrested and either shot or otherwise severely punished. Three of the bandits, who were arrested with four others last Monday, were shot at three o'clock on Tuesday morning near Celaya. These were Cipriano Roja of Celaya, the leader of the gang and a notorious robber, Pedro Herrera of Ameche and José Salinas. They confessed their crime, and said that among them was a foreman and four men of a section-gang employed on the railway, who removed the rail which threw the train from the track. Now that train-wrecking has been stopped and tranquility prevails along the line the confidence of the public ought soon to be restored, and travel on the Pullman express trains resume the prosperous condition which it was assuming before the recent attempts took place."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Boston & Lowell, special meeting, in Boston, June 12.

Central Vermont, annual meeting, at the office in St. Albans, June 19.

St. Joseph & Western, annual meeting, at Elwood, Kan., June 12.

St. Paul & Duluth, annual meeting, at the office in St. Paul, Minn., June 16, at noon.

Ulster & Delaware, annual meeting, at the office in Rondout, N. Y., June 11.

Vicksburg & Meridian, adjourned annual meeting, at the office in New York, July 16, at noon.

Dividends.

Dividends have been declared as follows:

Boston & Albany, 2 per cent., quarterly, payable June 30, to stockholders of record on May 31.

Eastern in New Hampshire (leased to Eastern Railroad Co.), 2¼ per cent., semi-annual, payable June 16.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Society of Civil Engineers, annual convention, in Buffalo, N. Y., beginning on Tuesday, June 10. Full arrangements have been announced.

Master Car-Builders' Association, annual convention, in Saratoga, N. Y., beginning on Tuesday, June 10.

Yard-Masters' Mutual Benefit Association, annual convention, in Atlanta, Ga., on Wednesday, June 11.

Master Mechanics' Association, annual convention, in Long Branch, N. J., beginning on Tuesday, June 17.

Railway Telegraph Superintendents' Association, annual convention, in Boston, on Tuesday, June 17.

General Baggage Agents' Association, semi-annual meeting, in Boston, on Wednesday, July 16.

Western Association of General Passenger & Ticket Agents, adjourned meeting, in Minneapolis, Minn., on Wednesday, Aug. 13.

Master Car-Painters' Association, annual convention, in Boston, on Wednesday, Sept. 3.

Road-Masters' Association of America, annual convention, in Indianapolis, Ind., on Wednesday, Sept. 10.

Association of American Railroad Superintendents, semi-annual meeting, in Boston, on Tuesday, Sept. 16.

National Association of General Passenger & Ticket Agents, semi-annual convention, in Boston, on Tuesday, Sept. 16.

New England Railroad Club, first monthly meeting for the season, at the rooms in the Boston & Albany station in Boston, on Wednesday, Sept. 24.

General Time Convention, fall meeting, at the Continental Hotel, Philadelphia, on Thursday, Oct. 9.

Southern Time Convention, fall meeting, at No. 46 Bond street, New York, on Wednesday, Oct. 15.

American Street Railway Association, annual convention, in New York, on Wednesday, Oct. 15.

Foreclosure Sales.

The Austin & Northwestern Railroad was offered for sale in Austin, Tex., May 28, under a decree of foreclosure. The minimum amount was fixed by the decree at $210,000, and no bidder offering that amount, the sale was adjourned until July 2 in Austin. The road is a narrow gauge line extending from Austin northwest about 60 miles.

Southern Railway & Steamship Association.

The Executive Committee met, pursuant to call, in Atlanta, Ga., May 29, General Commissioner Powers presiding. There was a full attendance, including the following members: Henry Fink, East Tennessee, Virginia & Georgia; A. L. Rives, Richmond & Danville; John Scott, Cincinnati Southern; R. A. Anderson, Western & Atlantic; John B. Peck, South Carolina; W. G. Raoul, Central; B. D. Hazel, New York & Charleston Steamship line; M. H. Smith, Louisville & Nashville; H. S. Haines, Savannah, Florida & Western; J. W. Thomas, Nashville, Chattanooga & St. Louis; R. R. Bridgers, Coast Line; and there were also present nearly all the members of the Rate Committee. The session was short and harmonious. After due consideration it was unanimously agreed to continue the pool agreement after July. It will be remembered that the continuance of the agreement was left to the Executive Committee by the action of the association at its last meeting.

The only other business brought before the committee was the question of the adoption of a uniform bill of lading for all lines on which there was no action taken, the matter being referred to a sub-committee.

American Institute of Mining Engineers.

The May meeting of the Institute of Mining Engineers began in Chicago May 27, about 100 members being present. Mr. O. W. Potter, Chairman of the Local Committee, called the meeting to order and made a brief address, introducing Mayor Harrison, who delivered an appropriate address of welcome. This was responded to by Mr. J. C. Bayles, of New York, President of the Institute. Mr. Bayles then delivered his annual address on the "Progress of Mining and Metallurgy in the United States," dwelling especially upon the iron and steel interests. After the delivery of this address the business session was begun and a number of papers were read.

On May 28 the members took a trip in the morning to the South Chicago Rolling Mills, after inspecting which they proceeded to Pullman by special train, lunch being served in the cars on the road. After inspecting the car works and other manufacturing establishments at Pullman they returned to Chicago, and in the evening a business session was held at which a number of papers were read and some of them discussed.

On the third day, May 29, the greater part of the day was taken up by an excursion to La Salle and the inspection of the zinc works there and other establishments, a business session being held in the evening.

The fourth day, May 30, was principally devoted to business, morning and evening sessions being held for the reading and discussion of papers. In the evening the annual banquet of the Institute was held, a large number of members and ladies being present. This concluded the spring meeting.

ELECTIONS AND APPOINTMENTS.

Albemarle & Raleigh.—At the annual meeting of the stockholders of this road, held at Raleigh, N. C., May 29, the following directors were elected: H. R. Baltzer, Henry J. Rogers, Alfred Lichtenstein, Charles Unger, George H. Schinzel, William Roessler, Adolph Hegewisch, W. G. Upchurch, Simon Sterne, John K. Cheevey, B. T. Strickland, Henry D. Roberson, Edwin Schultze.

Baltimore & Hanover.—At the annual meeting of the stockholders of this company, May 23, the following officers were elected: President, Capt. A. W. Eichelberger; Direc-

tors, Stephen Keefer, L. F. Melsheimer, Hanover, Pa.; Charles W. Slagle, Wm. H. Vickery, Baltimore; William E. Hoffman, Baltimore County, Md.; C. C. Wooden, Carroll County, Md.

Baltimore & Ohio.—Mr. Edward W. Grieves (for 16 years past Draughtsman and Assistant Foreman for the Harlan & Hollingsworth Co., in Wilmington, Del.) is appointed Acting Master Car-Builder in charge of the Mount Clare car shops in Baltimore.

Baltimore & Philadelphia.—Mr. D. F. Maroney is appointed Manager of the Car Record office of this company, with headquarters at Camden Station, Baltimore, to date from June 1. This is the Philadelphia extension of the Baltimore and Ohio road.

Baltimore & Potomac.—At the annual meeting in Baltimore, June 4, the following directors were chosen: Samuel Cox, Jr., Eli J. Henkle, B. F. Newcomer, George B. Roberts, George Small, Frank Thomson, W. T. Walters. The board re-elected Oden Bowie President; Frank Thomson, Vice-President; James P. Kerr, Secretary; John S. Lieb, Treasurer.

Canada Southern.—At the annual meeting in St. Thomas, Ont., June 4, the following directors were chosen: S. F. Barger, J. E. Brown, C. F. Cox, Sidney Dillon, A. G. Dulman, James Tillinghast, Cornelius Vanderbilt, Wm. H. Vanderbilt.

Canadian Pacific.—Mr. Robert Kerr has been appointed Assistant General Traffic Manager, with office at Winnipeg, Manitoba. He was recently General Freight and Passenger Agent of the Northern & Northwestern road.

Chesapeake & Delaware Canal Co.—At the annual meeting in Philadelphia, June 3, the following were elected: President, Andrew C. Gray. Directors, H. Pratt McKean, Isaiah V. Williamson, Edwin Swift, Charles H. Hutchinson, M. P. Hutchinson, Henry C. Ford, Joseph E. Gillingham, R. Dale Benson, Hood Gilpin, Gordon Monges, Peter C. Hollis, George H. Fisher, Henry Lewis, David Scull, Jr.

Chicago, Burlington & Quincy.—Mr. E. D. Lomax is appointed Assistant General Passenger Agent of this road, with headquarters at Chicago.

Chicago & Grand Trunk.—Mr. W. J. Spicer has been appointed General Manager in place of S. R. Callaway, resigned. Mr. Spicer is now General Superintendent of the Grand Trunk.

Chicago, Parkersburg & Norfolk.—At a meeting of the stockholders last week the following board of directors was elected: A. E. Boone, Zanesville, O.; W. W. Lucas, William M. Moore, Harmar, O.; T. O. Walker, Des Moines, Ia.; G. M. Tought, Isaac Scott, George Loomis, A. W. Williams, S. S. Shaw, C. B. Smith, G. B. Gibbons, A. B. Beckwith, Parkersburg, W. Va.; D. C. Casto, Elizabeth, N. J. The board organized by electing the following officers: President and General Manager, A. E. Boone; Vice-President, Isaac Scott; Secretary, W. W. Lucas; Treasurer, George Loomis; Auditor, A. W. Williams; Attorney, W. L. Cole; Chief Engineer, J. B. Gates.

Chicago, Rock Island & Pacific.—At the annual meeting in Chicago, June 4, the following directors (one-third of the board) were chosen for three years: Henry H. Porter, Francis H. Tows, James R. Cowing, Marshall Field. The only change is the election of Mr. Field in place of Jay Gould. Mr. John Newell was run against Mr. Porter by the Vanderbilt interest, but was defeated by a large majority. The board elected R. R. Cable President; David Dows and A. Kimball, Vice-Presidents; Francis H. Tows, Secretary and Treasurer; Hugh Riddle, R. R. Cable, H. R. Bishop, David Dows and Francis H. Tows, Executive Committee.

Columbus & Eastern.—At the annual meeting in Columbus, O., May 29, this company elected the following directors: J. E. Redfield, G. G. Collins, C. D. Firestone, D. D. Warren, R. W. Reynolds, John R. Hughes, George Bellows, Augustine Converse, J. A. Euffrey. The board organized by electing J. E. Redfield, President; G. G. Collins, Vice-President; J. C. Donaldson, Secretary; W. E. Guerin, Solicitor; C. H. Roser, General Manager.

Concord.—The directors of this company met at Manchester, N. H., May 29, and elected the following officers: Frederick Smyth, of Manchester, President; Josiah Minot, Benjamin A. Kimball, of Concord, Executive Committee; W. M. Chase, of Concord, Clerk.

Concord & Claremont.—At the annual meeting of this company the following directors were elected: Henry C. Sherburne, George E. Todd, Charles O. Stearns, Mason W. Tappan, Charles P. Sanborn, Daniel W. Johnson, Dexter Richards, Henry C. Sherburne was elected President; Charles P. Sanborn Clerk; George A. Kettell Treasurer; George K. Hazeltine Assistant Treasurer.

Delaware, Maryland & Virginia.—This company has re-elected N. L. McCready President and W. H. Stanford Vice-President, and the number of directors has been increased to fifteen.

Denver & Rio Grande.—Mr. S. K. Hooper has been appointed General Passenger Agent in place of Mr. F. C. Nims, resigned. Mr. Hooper was formerly General Passenger Agent of the Hannibal & St. Joseph, and was appointed a few weeks since to the same position on the Central Iowa road.

Eastern.—The following circular from Mr. Amos Pilsbury, Master of Rolling Stock, is dated East Boston, May 23: "Mr. Arthur M. Waitt has been appointed General Foreman of Car Department, in place of Mr. J. D. Billings, resigned, and will be respected and obeyed accordingly. The appointment to take effect June 1, 1884. From this date all reports, requisitions, letters and telegrams relating to the general business of the Car Department must be addressed to A. Pilsbury, Master of Rolling Stock at East Boston. All communications relating to cars, or repairs of cars, should be addressed to Arthur M. Waitt, General Foreman, Car Department, Salem, Mass. All orders for work (either new work or repairs necessary for other departments, must be addressed to the General Manager or the Master of Rolling Stock."

Eastern Railroad Leased Line.—At the annual meetings held June 3 directors were chosen as follows for the companies named, whose properties are leased to the Eastern Railroad Co.: *Portland, Saco & Portsmouth.*—Arthur Sewall, Bath, Me.; F. R. Barrett, George E. B. Jackson, Portland, Me.; Frank Jones, Portsmouth, N. H.; W. B. Bacon, Samuel C. Lawrence, Richard Olney, Boston. *Portsmouth Bridge Co.*—W. B. Bacon, S. H. Frink, W. H. Hackett, Frank Jones, Samuel C. Lawrence, John W. Sanborn, Arthur Sewall. *Portsmouth, Great Falls & Conway.*—Frank Jones, Samuel C. Lawrence, John W. Sanborn, C. H. Sawyer, Arthur Sewall.

Erie & Western Transportation Co.—At the annual meeting in Philadelphia, June 3, the following directors were elected: George B. Bonnell, Frank J. Firth, H. H. Houston, Joseph D. Potts, William Thaw.

RAILROAD EARNINGS IN APRIL.

NAME OF ROAD.	MILEAGE. 1884.	1883.	Inc.	Dec.	P. c.	EARNINGS. 1884.	1883.	Inc.	Dec.	P. c.	EARNINGS PER MILE. 1884.	1883.	Inc.	Dec.	P. c.
EASTERN ROADS.															
Eastern	284	284	..	....	....	266,320	267,616	....	1,296	0.5	937	942	..	5	0.5
Grand Trunk	2,321	2,321	....	....	....	1,252,357	1,473,509	....	221,152	15.0	540	635	..	95	15.0
Long Island	354	354	....	....	....	186,595	170,893	15,702	....	9.2	527	483	44	....	9.2
N. Y. & New England	400	400	....	....	....	275,507	275,891	....	384	0.1	689	690	..	1	0.1
N. Y., Sus. & Western	147	147	....	....	....	82,278	78,511	3,767	....	4.8	560	534	26	..	4.8
Northern Central	322	322	....	....	....	454,749	476,335	....	21,586	4.5	1,412	1,479	....	67	4.5
Pennsylvania*	2,103	2,048	55	....	2.7	4,156,309	4,061,750	94,559	....	2.3	1,976	1,983	....	7	0.4
Philadelphia & Reading†	1,560	1,000	560	....	56.0	2,855,673	1,726,616	1,129,057	....	65.4	1,831	1,727	104	....	6.0
Rochester & Pittsburgh	294	222	72	....	32.4	83,437	31,407	52,030	....	165.7	284	141	143	....	101.4
West Jersey	188	188	....	....	....	93,185	76,023	17,162	....	22.6	496	404	92	....	22.6
Total, 10 roads	7,973	7,286	687	....	....	9,706,410	8,638,551	1,312,277	244,418	....	1,217	1,186	31	....	....
Total inc. or dec	....	....	687	....	9.4	....	....	1,067,859	....	12.4	....	....	31	....	2.6
SOUTHERN ROADS.															
Alabama Great Southern	290	290	....	....	....	84,500	73,414	11,086	....	15.2	291	253	38	....	15.2
Chesapeake & Ohio	517	517	....	....	....	296,367	298,629	....	2,262	0.7	573	577	....	4	0.7
Eliz., Lex. & Big Sandy	130	130	....	....	....	58,863	47,540	11,323	....	23.8	453	366	87	....	23.8
Cin., N. O. & Tex. Pacific	336	336	....	....	....	211,495	173,116	38,379	....	22.2	629	515	114	....	22.2
East Tenn., Va. & Ga.	1,098	1,059	39	....	3.7	286,882	273,322	13,560	....	5.0	261	258	3	....	1.2
Mem. & Charleston	292	292	....	....	....	101,703	80,766	20,937	....	25.8	348	277	71	....	25.8
Fla. Ry. & Nav. Co.	477	477	....	....	....	76,943	61,498	15,445	....	25.0	161	129	32	....	25.0
Louisville & Nash.	2,085	2,028	37	....	1.8	1,103,750	947,450	156,300	....	16.5	535	469	66	....	14.0
Mobile & Ohio	528	528	....	....	....	170,000	128,866	41,134	....	31.8	322	244	78	....	31.8
Nashville, Chatta. & St. L.	554	554	....	....	....	188,167	161,435	26,732	....	16.6	340	293	47	....	16.6
N. Orleans & Northeastern	195	70	125	....	178.6	25,262	5,881	19,381	....	328.5	130	84	46	....	54.8
Norfolk & Western	503	428	75	....	17.5	211,522	190,996	20,526	....	11.0	422	446	..	24	5.4
Shenandoah Valley	249	249	....	....	....	58,865	60,677	....	1,812	3.0	237	244	....	7	3.0
Rich. & Danville	757	757	....	....	....	317,181	267,409	49,772	....	18.6	419	353	66	....	18.6
Char., Col. & Augusta	356	339	17	....	5.0	54,816	52,953	1,863	....	3.5	154	156	....	2	1.3
Col. & Greenville	296	296	....	....	....	45,728	43,092	2,636	....	6.1	154	145	9	....	6.1
Virginia Midland	352	352	....	....	....	130,841	125,825	5,016	....	4.0	372	357	15	....	4.0
Western N. Carolina	210	190	20	....	10.5	33,838	21,766	12,072	....	54.9	161	115	46	....	40.0
South Carolina	247	243	4	....	1.6	73,310	78,950	....	5,640	7.7	297	325	....	28	8.6
Vicksburg & Meridian	142	142	....	....	....	36,104	29,237	6,867	....	23.7	254	206	48	....	23.7
Total, 20 roads	9,594	9,277	317	....	....	3,566,137	3,122,822	453,029	9,714	....	372	337	35	....	....
Total inc. or dec	....	....	317	....	3.4	....	....	443,315	....	14.2	....	....	35	....	10.4
CENTRAL GROUP.															
Chi. & Eastern Ill	252	252	....	....	....	110,248	123,769	....	13,521	10.9	438	491	....	53	10.9
Chi. & West Michigan	410	390	20	....	5.1	140,190	129,959	10,231	....	7.9	342	333	9	....	2.7
Cin., Ind., St. L. & Chicago	342	342	....	....	....	193,509	193,141	368	....	0.2	566	565	1	....	0.2
Cin., Wash. & Baltimore	284	284	....	....	....	134,628	142,522	....	7,894	5.5	474	502	....	28	5.5
Cleve., Akron & Columbus	144	144	....	....	....	40,534	40,674	....	140	0.3	281	282	....	1	0.3
Detroit, Lansing & No.	258	226	32	....	14.2	137,753	136,702	1,051	....	0.8	534	605	....	71	11.8
Evansville & Terre Haute	146	146	....	....	....	61,498	55,289	6,209	....	11.3	421	379	42	....	11.3
Flint & Pere Marquette	362	347	15	....	4.3	216,322	235,935	....	19,613	8.3	598	680	....	82	12.1
Illinois Central‡	1,536	1,501	25	....	1.7	797,100	699,370	97,730	....	13.9	522	466	56	....	11.9
Indiana, Bloom. & West	695	695	....	....	....	195,751	215,914	....	20,163	9.3	282	311	....	29	9.3
Ohio Central	284	232	52	....	22.4	86,230	67,986	18,250	....	27.0	304	293	11	....	3.8
Ohio & Mississippi	615	615	....	....	....	332,778	337,085	....	4,307	1.2	541	548	....	7	1.2
Peoria, Decatur & Ev.	254	254	....	....	....	58,799	60,059	....	1,260	2.1	231	236	....	5	2.1
St. L., Alton & Terre Haute:															
Main Line	195	195	....	....	....	110,057	102,276	7,731	....	7.6	564	524	40	....	7.6
Belleville Line	121	121	....	....	....	66,708	58,976	7,732	....	13.1	551	487	64	....	13.1
Total, 15 roads	5,888	5,744	144	....	....	2,682,061	2,599,657	149,302	66,898	....	455	453	2	....	....
Total inc. or dec	....	....	144	....	2.5	....	....	82,404	....	3.2	....	....	2	....	0.4
NORTHWESTERN ROADS.															
Bur., Cedar Rap. & No.	714	714	....	....	....	217,576	218,253	....	677	0.3	305	306	....	1	0.3
Central Iowa	401	305	96	....	31.5	122,907	100,805	22,102	....	21.9	306	331	....	25	7.6
Chi. & Alton	850	850	....	....	....	606,804	600,878	5,926	....	1.0	714	707	7	....	1.0
Chi., Mil. & St. Paul	4,760	4,520	240	....	5.3	1,949,000	1,972,270	....	23,270	1.2	409	436	....	27	6.2
Chi. & Northwestern	3,850	3,580	270	....	7.5	1,804,800	1,754,379	50,421	....	2.9	469	490	....	21	4.3
Chi., St. P., Minn & O.	1,290	1,170	120	....	10.3	548,100	434,071	114,029	....	26.3	425	371	54	....	14.1
Des Moines & Ft. Dodge	138	138	....	....	....	28,068	23,182	4,886	....	21.2	203	168	35	....	21.2
Green Bay, Win. & St. P.	220	220	....	....	....	30,228	36,662	....	6,434	17.2	137	167	....	30	17.2
Ill. Central, Iowa lines	402	402	....	....	....	131,300	156,967	....	25,667	16.3	327	390	....	63	16.3
Marquette, H. & Ont	138	100	38	....	38.0	24,382	17,277	7,106	....	42.5	177	173	4	....	2.3
Mil., Lake Shore & West	374	326	48	....	14.5	95,605	90,037	5,568	....	6.2	256	276	....	20	7.2
Mil. & Northern	227	185	42	....	22.7	44,605	42,260	2,345	....	5.6	197	228	....	31	13.5
Wisconsin Central	440	440	....	....	....	124,748	124,678	70	....	0.1	283	283	....	....	....
Total, 13 roads	13,804	12,950	854	....	....	5,728,124	5,571,719	212,453	56,048	....	415	430	....	15	....
Total inc. or dec	....	....	854	....	6.6	....	....	156,405	....	2.8	....	....	....	15	3.5
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pacific	2,033	1,150	883	....	76.8	343,478	402,400	....	58,922	14.6	169	350	....	181	51.7
Northern Pacific	2,496	1,700	796	....	46.8	1,438,600	665,508	773,092	....	116.2	576	391	185	....	47.3
St. P. & Duluth	227	210	17	....	8.1	83,814	76,795	7,019	....	9.1	369	365	4	....	1.1
St. P., Minn. & Manitoba	1,387	1,250	137	....	10.9	804,999	812,016	....	7,017	0.8	580	650	....	90	13.8
Total, 4 roads	6,143	4,310	1,833	....	....	2,670,891	1,956,719	780,111	65,939	....	435	454	....	19	....
Total inc. or dec	....	....	1,833	....	42.6	....	....	714,172	....	36.5	....	....	....	19	4.2
SOUTHWESTERN ROADS.															
Fort Worth & Denver	110	110	..	....	....	40,700	26,700	14,000	....	51.8	370	243	127	....	51.8
Gulf, Colorado & Santa Fe	536	480	56	....	11.7	129,775	120,064	9,711	....	8.1	242	250	....	8	3.2
Houston, E. & W. Tex.§	140	120	20	....	16.7	19356	24,884	....	5,528	22.1	138	207	....	69	33.3
Kan. City, Ft. Scott & G.	389	389	....	....	....	176,164	134,220	41,944	....	31.3	453	345	108	....	31.3
Little Rock & Ft. Smith	173	168	5	....	3.0	35,352	36,662	....	1,310	3.6	204	218	....	14	6.4
Little Rock, Miss. R. & Tex.	173	173	....	....	....	24,935	30,310	....	5,375	17.8	144	175	....	31	17.8
Missouri Pacific‖	1,895	1,895	....	....	....	1,196,657	1,150,057	46,600	....	4.1	632	607	25	....	4.1
St. L., Ft. Scott & Wichita	160	128	32	....	25.0	32,389	15,063	17,326	....	115.5	202	118	84	....	71.2
St. L. & San Francisco	750	724	26	....	3.6	363,489	274,011	89,478	....	32.6	484	388	96	....	24.6
Vicks., Shreveport & P.	124	73	51	....	69.8	5,586	3,151	2,435	....	77.3	45	44	1	..	2.3
Total, 10 roads	4,450	4,260	190	....	....	2,024,403	1,815,122	221,494	12,213	....	455	426	29	....	....
Total inc. or dec	....	....	190	....	4.5	....	....	209,281	....	11.5	....	....	29	....	6.7
FAR WESTERN AND PACIFIC ROADS.															
Central Pacific	3,003	2,941	62	....	2.1	2,034,000	2,050,312	....	16,312	0.8	677	697	..	20	3.0
Total, 1 road	3,003	2,941	62	....	....	2,034,000	2,050,312	....	16,312	....	677	697	....	20	....
Total inc. or dec	....	....	62	....	2.1	....	....	....	16,312	0.8	..	....	....	20	2.9
GRAND TOTAL:															
Total, 73 roads	50,855	46,768	4,087	....	....	28,079,248	25,417,817	3,128,666	471,542	....	552	544	8	....	....
Total inc. or dec	....	....	4,087	....	8.7	....	....	2,657,124	....	10.5	....	....	8	....	1.5

* Includes all lines east of Pittsburgh and Erie.
† Includes New Jersey Central in 1884.
‡ Includes Illinois lines and Southern Division.
§ Not in table for the four months.
‖ Includes Iron Mountain lines.

Fargo Southern.—Mr. C. J. Eddy has been appointed General Freight and Passenger Agent, with office at Fargo, Dak. He was recently on the Chicago, Milwaukee & St. Paul.

Flint & Pere Marquette.—At the annual meeting in East Saginaw, Mich., May 21, the following directors were elected: Wm. W. Crapo, Francis Hathaway, Loum Snow, New Bedford, Mass.; Lewis Pierce, Portland, Me.; Alfred M. Hoyt, Samuel L. Hoyt, Cornelius D. Wood, New York; Dr. A. G. Brower, Utica, N. Y.; H. C. Potter, Wm. L. Webber, H. C. Potter, Jr., East Saginaw.

Greencastle & Southern.—The officers of this new company are: President, W. H. Denham; Vice President, W. Ermentrout; Secretary and Treasurer, W. H. Brown. Office in Greencastle, Indiana.

RAILROAD EARNINGS, FOUR MONTHS ENDING APRIL 30.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1884.	1883.	Inc.	Dec.	P. c.	1884.	1883.	Inc.	Dec.	P. c.	1884.	1883.	Inc.	Dec.	P.c.
EASTERN ROADS.															
Eastern	284	284	....	....	...	$ 1,031,983	$ 1,053,684	$	$ 21,701	2.1	$ 3,634	$ 3,710	$	$ 76	2.1
Grand Trunk	2,317	2,321	....	4	0.2	5,163,091	5,793,288	.....	630,197	10.8	2,228	2,496	....	268	10.7
Long Island	354	354	....	....	....	624,545	592,307	32,238	.....	5.4	1,764	1,673	91	....	5.4
N. Y. & New Eng.	400	400	....	....	....	1,034,266	1,055,594	.....	21,328	2.0	2,586	2,639	....	53	2.0
N. Y., Sus. & West.	147	147	....	....	....	282,177	290,289	.....	8,112	2.8	1,920	1,974	....	54	2.8
Northern Central	322	322	....	....	....	1,725,772	1,969,318	.....	243,546	12.3	5,360	6,116	....	756	12.3
Pennsylvania*	2,103	2,048	55	....	2.7	15,159,907	15,892,707	.....	732,800	4.6	7,209	7,760	....	551	7.1
Phila. & Reading†	1,560	1,000	560	....	56.0	9,241,959	6,458,494	2,783,465	.....	43.1	5,924	6,458	....	534	8.3
Rochester & Pitts.	294	149	145	....	93.7	314,906	105,679	209,227	.....	197.4	1,071	709	362	....	51.1
West Jersey	188	180	8	....	4.4	312,164	276,748	35,416	.....	12.6	1,660	1,537	123	....	8.0
Total 10 roads	7,969	7,205	768	4	....	34,890,770	33,488,108	3,060,346	1,657,684	....	4,378	4,648	....	270	....
Total inc. or dec.	.....	.....	764	....	10.6	.....	.....	1,402,662	.....	4.2	.....	.....	....	270	5.8
SOUTHERN ROADS.															
Ala. Gt. Southern	299	299	....	....	....	351,281	330,075	21,206	.....	6.4	1,211	1,138	73	....	6.4
Ches. & Ohio	517	517	....	....	....	1,151,171	1,141,841	9,330	.....	0.8	2,226	2,208	18	....	0.8
Eliz., Lex. & B. S	130	130	....	....	....	210,240	203,976	6,244	.....	3.1	1,617	1,569	48	....	3.1
Cin., N. O. & Tex. P	333	336	....	....	....	785,676	740,438	45,238	.....	6.1	2,358	2,204	136	....	6.1
East Tenn., Va. & Ga.	1,098	1,059	39	....	3.7	1,248,261	1,248,236	25	.....	.....	1,137	1,179	....	42	3.7
Memphis & Char.	292	292	....	....	....	439,259	398,930	40,329	.....	10.1	1,504	1,366	138	....	10.1
Fla. Ry. & Nav. Co‡	477	477	....	....	....	354,175	297,225	56,950	.....	19.0	743	623	120	....	19.0
Louisville & Nash.	2,065	2,028	37	....	1.8	4,346,236	4,222,329	123,907	.....	2.9	2,105	2,082	23	....	1.1
Mobile & Ohio	528	528	....	....	....	709,584	698,167	11,417	.....	1.6	1,344	1,322	22	....	1.6
Nash., Chat. & St. L.	554	554	....	....	....	792,473	760,250	32,223	.....	4.2	1,430	1,372	58	....	4.2
N. Or. & Nor'east.	195	49	146	....	298.0	132,910	22,354	110,556	.....	493.6	682	456	226	....	49.6
Norfolk & Western	503	428	75	....	17.5	860,197	800,162	60,035	.....	7.5	1,710	1,870	....	160	8.0
Shenandoah Val.	249	249	....	....	....	233,090	213,803	19,287	.....	9.0	936	859	77	....	9.0
Rich. & Danville	757	757	....	....	....	1,273,954	1,208,828	65,126	.....	5.4	1,683	1,597	86	....	5.4
Char., Col. & Aug.	354	339	14	....	4.1	271,359	301,723	.....	30,364	10.1	769	890	....	111	12.5
Col. & Greenville	296	296	....	....	....	234,070	297,782	.....	63,712	21.4	791	1,006	....	215	21.4
Va. Midland	353	352	....	....	....	466,909	467,616	.....	707	0.2	1,326	1,328	....	2	0.2
Western N. C	203	190	13	....	6.8	129,182	95,580	33,602	.....	35.0	636	503	133	....	26.5
South Carolina	247	243	4	....	1.6	446,905	494,925	.....	48,020	10.7	1,809	2,037	....	228	11.2
Vicks. & Meridian	142	142	....	....	....	161,243	169,336	.....	8,093	4.8	1,136	1,293	....	57	4.8
Total, 20 roads	9,584	9,256	328	....	....	14,598,155	14,113,576	635,475	150,896	....	1,523	1,525	....	2	....
Total inc. or dec.	.....	.....	328	....	3.5	.....	.....	484,579	.....	3.4	.....	.....	....	2	0.1
CENTRAL GROUP.															
Chi. & Eastern Ill.	252	252	....	....	....	457,027	514,485	.....	57,458	11.2	1,814	2,042	....	228	11.2
Chi. & West Mich.	410	390	20	....	5.1	493,426	480,060	13,366	.....	2.4	1,203	1,231	....	28	2.3
Cin., Ind., St. L. & Chi	342	342	....	....	....	703,009	752,663	.....	49,654	6.6	2,056	2,201	....	145	6.6
Cin., Wash. & Balt.	284	284	....	....	....	539,671	582,484	.....	42,813	7.3	1,900	2,051	....	151	7.3
Cleve., Akron & Col.	144	144	....	....	....	141,062	159,637	.....	18,575	11.6	980	1,108	....	128	11.6
Det., Lan. & No.	258	226	32	....	14.2	435,934	476,323	.....	40,389	8.5	1,689	2,108	....	419	19.9
Ev. & Terre Haute	146	146	....	....	....	214,529	224,434	.....	9,905	4.4	1,469	1,537	....	68	4.4
Flint & Pere Marq.	362	347	15	....	4.3	811,221	822,102	.....	10,881	1.3	2,241	2,369	....	128	5.3
Illinois Central§	1,526	1,501	25	....	1.7	3,242,800	3,458,460	.....	215,660	6.2	2,125	2,304	....	179	7.8
Ind., Bloom. & West	695	695	....	....	....	829,616	935,789	.....	106,173	11.4	1,193	1,346	....	153	11.4
Ohio Central	284	282	52	....	22.4	331,057	296,617	34,440	.....	11.5	1,166	1,279	....	113	8.9
Ohio & Mississippi	615	615	....	....	....	1,327,728	1,362,152	.....	34,424	2.5	2,159	2,215	....	56	2.5
Peoria, Dec. & Ev.	254	254	....	....	....	248,799	213,525	35,274	.....	16.5	980	841	139	....	16.5
St. L., Alton & T. H.															
Main Line	195	195	....	....	....	481,432	496,228	.....	14,796	3.0	2,469	2,545	....	76	3.0
Belleville Line	121	121	....	....	....	267,855	275,385	.....	7,530	2.7	2,214	2,276	....	62	2.7
Total, 15 roads	5,888	5,744	144	....	....	10,525,166	11,050,344	82,080	608,258	....	1,788	1,924	....	136	....
Total inc. or dec.	.....	.....	144	....	2.6	.....	.....	.....	525,178	4.8	.....	.....	....	136	7.1
NORTHWESTERN ROADS.															
Bur., Ced. Rap. & No.	714	714	....	....	....	850,752	855,570	.....	4,818	0.5	1,192	1,198	....	6	0.5
Central Iowa	401	305	96	....	31.5	447,203	373,896	73,307	.....	19.6	1,115	1,225	....	110	9.1
Chi. & Alton	850	850	....	....	....	2,541,972	2,491,342	50,630	.....	2.1	2,991	2,931	60	....	2.1
Chi., Mil. & St. P.	4,760	4,520	240	....	5.3	6,524,000	6,632,245	.....	109,245	1.6	1,370	1,467	....	97	6.5
Chi. & N. W.	3,837	3,580	257	....	7.2	6,569,618	6,518,688	50,930	.....	0.8	1,712	1,821	....	109	6.0
Chi., St. P., M. & O.	1,290	1,170	120	....	10.3	1,681,106	1,466,864	214,242	.....	14.2	1,303	1,254	49	....	3.9
Des Moines & Ft. D	138	138	....	....	....	107,347	93,693	13,654	.....	14.4	778	679	99	....	14.4
Green Bay, W. & St. P	220	220	....	....	....	116,364	121,161	.....	4,797	3.9	529	551	....	22	3.9
Ill. Cent., Iowa lines	402	402	....	....	....	526,800	610,686	.....	83,866	13.7	1,310	1,579	....	269	13.7
Marquette, H. & O.	121	100	21	....	21.0	87,825	75,052	12,773	.....	17.0	726	751	....	25	3.3
Mil., L. S. & W.	374	321	53	....	16.5	342,140	295,251	46,889	.....	15.8	915	920	....	5	0.6
Mil. & Northern	227	185	42	....	22.7	163,320	142,615	20,705	.....	14.5	719	771	....	52	6.8
Wisconsin Central	440	440	....	....	....	492,059	441,141	50,918	.....	11.5	1,118	1,003	115	....	11.5
Total, 13 roads	13,774	12,945	829	....	....	20,449,506	20,118,184	534,048	202,726	....	1,485	1,554	....	69	....
Total inc. or dec	.....	.....	829	....	6.4	.....	.....	331,322	.....	1.6	.....	.....	....	69	4.4
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pacific	2,008	1,150	858	....	74.6	1,127,777	1,082,297	45,480	.....	4.2	562	941	....	379	40.3
Northern Pacific	2,461	1,618	843	....	52.6	3,424,600	1,996,767	1,427,833	.....	71.5	1,392	1,234	158	....	12.8
St. P. & Duluth	227	210	17	....	8.1	286,292	296,932	.....	10,640	3.5	1,261	1,414	....	153	10.9
St. P., Minn. & Man	1,387	1,250	137	....	10.9	2,361,533	2,421,205	.....	59,672	2.5	1,703	1,935	....	232	12.2
Total, 4 roads	6,083	4,228	1,855	....	....	7,200,202	5,797,201	1,473,313	70,312	....	1,184	1,371	....	187	....
Total inc. or dec.	.....	.....	1,855	....	44.0	.....	.....	1,403,001	.....	24.2	.....	.....	....	187	13.6
SOUTHWESTERN ROADS.															
Ft. Worth & Den.	110	110	....	....	....	121,000	101,900	19,100	.....	18.7	1,100	926	174	....	18.7
Gulf, Col. & S. F.	536	468	68	....	14.5	528,371	556,773	.....	28,202	5.1	986	1,190	....	204	17.1
K. C., Ft. S. & Gulf	389	389	....	....	....	744,584	595,781	148,803	.....	24.9	1,914	1,532	382	....	24.9
Little R'k. & Ft. S.	173	168	5	....	3.0	155,280	169,29?	.....	14,012	8.3	898	1,008	....	110	11.0
Lit. R'k., Miss. R. & T.	173	173	....	....	....	107,268	134,548	.....	27,280	20.2	620	778	....	158	20.2
Missouri Pacific	1,895	1,895	....	....	....	5,173,946	5,181,686	.....	7,740	0.2	2,730	2,734	....	4	0.2
St. L., Ft. S. & W.	160	128	32	....	25.0	454,581	56,446	98,135	.....	173.7	966	441	525	....	119.0
St. L. & San Fran.	759	724	26	....	3.6	1,428,469	1,140,299	288,170	.....	25.2	1,905	1,575	330	....	21.0
Vicks., Sh. & Pac.	117	73	44	....	60.3	43,398	28,924	14,474	.....	49.9	371	399	....	28	7.0
Total, 9 roads	4,303	4,128	175	....	....	8,457,097	7,965,649	568,682	77,234	....	1,965	1,930	35	....	.....
Total inc. or dec.	.....	.....	175	....	4.2	.....	.....	491,448	.....	6.2	.....	.....	35		1.8
FAR WESTERN AND PACIFIC ROADS.															
Central Pacific	3,003	3,036	....	33	1.1	6,625,000	7,288,478	.....	663,478	9.1	2,206	2,401	..	195	8.1
Total, 1 road	3,003	3,036	....	33	....	6,625,000	7,288,478	.....	663,478	....	2,206	2,401	....	195	....
Total inc. or dec.	.....	.....	....	33	1.1	.....	.....	.....	663,478	9.1	.....	.....	....	195	8.1
GRAND TOTAL:															
Total, 72 roads	50,604	46,542	4,099	37	....	102,745,896	99,821,540	6,354,944	3,430,588	....	2,030	2,145	....	115	....
Total inc. or dec.	.....	.....	4,062	....	8.7	.....	.....	2,924,356	.....	2.9	.....	.....	....	115	5.4

* Includes all lines east of Pittsburgh and Erie.
† Includes New Jersey Central in 1884.
‡ Includes Florida Central and Florida Transit roads.
§ Includes Illinois lines and Southern Division.
‖ Includes Iron Mountain lines.

Illinois Central Proprietary Lines.—At the annual meeting in Chicago last week officers were chosen as below for the companies named, which are owned and controlled by the Illinois Central Co.: *Chicago & Springfield.*—President, J. C. Clarke; Secretary, A. G. Hackstaff; Treasurer, Henry De Wolf. *Kankakee & Southwestern.*—President, J. C. Clarke; Directors, A. H. Hanson, Henry De Wolf, E. T. Jeffery, W. J. Mauriac. *South Chicago.*—President, J. C. Clarke; Directors, J. C. Clarke, W. J. Mauriac; Secretary, A. G. Hackstaff; Treasurer, Henry De Wolf.

Jeffersonville, Madison & Indianapolis.—At the annual meeting in Jeffersonville, Ind., May 21, the following directors were elected: J. N. McCullough, Wm. Thaw, Thos. D. Messler, John P. Green, W. W. Barnes, J. H. McCampbell, Geo. S. McKiernan, Jas. McCrea, S. H. Patterson, J. L. Bradley, J. I. Irwin, Robert McKim.

Kansas City, Arkansas & Fort Smith.—The office of this new company is at Fort Smith, Ark.; the directors are A. Birden, A. J. Egy, B. S. Morris, J. B. Newberry and J. R. Rutherford.

Louisville, New Albany & Chicago.—Mr. John B. Carson, late Vice-President and General Manager of the Hannibal & St. Joseph road has been appointed General Manager of this road. It is understood that he will shortly succeed Mr. Roosevelt as President.

Manchester & Lawrence.—At the annual meeting of the stockholders of this road the following directors were chosen: Benjamin F. Martin, Nathan Parker, Manchester, N. H.; Edward A. Abbott, William A. Tower, Boston; Joseph W. Smith, Andover, Mass.; Asa Fowler, John A. White, Concord. Subsequently Mr. Martin was elected President, S. N. Bell Clerk and G. B. Chandler President.

Montpelier & Wells River.—At the annual meeting of this company in Montpelier, Vt., May 29, the following directors were elected: D. R. Sortwell, Cambridge, Mass.; S. S. Thompson, Lyndonville, Vt.; W. H. H. Bingham, Stowe, Vt.; Joel Foster, S. C. Shurtleff, Montpelier, Vt.; D. R. Sortwell was elected President; S. S. Thompson, Vice-President; Joel Foster, Secretary and Treasurer; W. A. Stowell, General Superintendent; Fred W. Morse, Cashier and General Freight and Passenger Agent; H. W. Whitcomb, Superintendent of Transportation.

Nashua & Lowell.—At the annual meeting of this company the following directors were elected: Francis A. Brooks, Francis V. Parker, Gedney K. Richardson, Boston; Jeremiah W. White, Cornelius V. Dearborn, William W. Bailey, Nashua, N. H.; A. M. Shaw, Lebanon, N. H.; Treasurer, Charles B. Brooks, Boston; Corporation Clerk, Walter A. Lovering, Nashua. The road is leased to the Boston & Lowell.

Nicaragua.—In order to effect a thorough reorganization of the management the government of Nicaragua has made the following appointments on the railroad which it owns: Theodore E. Hocke, General Manager; José A. Roman, Superintendent. Mr. Hocke was recently Engineer of Public Works under construction, and Mr. Roman Postmaster-General of the republic.

Norfolk & Virginia Beach.—The officers of the company are as follows: Marshall Parks, President; H. W. Page, Secretary; W. J. Welsh, Treasurer; J. M. Dickey, General Manager. Directors: J. Hopkins, Pennsylvania; H. C. Comegys, New York; S. K. Jackson, Hugh N. Page, W. G. Elliott, Norfolk, Virginia.

Northern (New Hampshire).—At the annual meeting of the stockholders of this company in Concord, N. H., May 28, the following directors were elected: Henry C. Sherburne, George E. Todd, Concord, N. H.; Alvah W. Sulloway, Geo. W. Nesmith, Franklin, N. H.; Uriel Crocker, Francis B. Hayes, Josiah H. Benton, Jr., Boston. Henry C. Sherburne was chosen President; William L. Foster, Clerk; George A. Kettell, of Boston, Treasurer; George K. Hazeltine, of Concord, Assistant Treasurer.

Northern Pacific.—Mr. J. W. Smith, recently Assistant to J. B. Cable, Superintendent of the Rocky Mountain and Idaho Divisions of this road has been appointed Superintendent of the Idaho Division, Mr. Cable still continuing as Superintendent of the Rocky Mountain Division.

Northern & Northwestern, of Canada.—Mr. Robert Quinn has been appointed General Freight and Passenger Agent in place of Robert Kerr, who has gone to the Canadian Pacific.

Old Colony Steamboat Co.—At the annual meeting in Boston, June 3, the following directors were chosen: Frederick L. Amos, N. Bliss, Thomas J. Borden, John S. Brayton, Charles F. Choate, Francis B. Hayes, Leander N. Lovell, Silas Pierce, Nathaniel Thayer. The company is controlled by the Old Colony Railroad Company.

Pennsylvania.—Mr. George De Haven has been appointed Passenger Agent of the Baltimore District, with office in Baltimore.

Pennsylvania Company.—At the annual meeting in Pittsburgh, June 3, the following directors were chosen: W. H. Barnes, J. N. McCullough, Thomas D. Messler, Wm. Thaw, Pittsburgh; A. J. Cassatt, J. N. DuBarry, John P. Green, H. H. Houston, Wistar Morris, Henry M. Phillips, George B. Roberts, Edmund Smith, J. P. Wetherill, Philadelphia.

Peterboro.—At the annual meeting of this road the following board of directors were elected: James Scott, Thomas Eaton, S. A. B. Abbott, John H. George, George A. Ramsdell, Edward Spalding and Frank McKean; clerk, G. C. Shattuck. The road is leased to the Boston & Lowell.

Peterboro & Hillsboro.—At the annual meeting of this company in Concord, N. H., May 30, the following directors were elected: Henry C. Sherburne, George E. Todd, Concord, N. H.; Henry K. French, Peterboro, N. H.; John C. Campbell, Hillsboro Bridge, N. H.; George W. Nesmith, Alvah W. Sulloway, Franklin, N. H.; Josiah H. Benton, Jr., Boston. The board organized with Mr. Sherburne President; E. H. Woodman, Clerk.

Pittsburgh, Cleveland & Toledo.—Mr. Charles W. Bassett is appointed General Passenger Agent, with office in Youngstown, O. He was recently on the New York, Pennsylvania & Ohio road.

Rome, Watertown & Ogdensburg.—At the annual meeting in Watertown, N. Y., June 4, the following directors were chosen: Clarence S. Day, Henry Day, John S. Farlow, Walton Ferguson, John Q. A. Johnson, Josiah Lasell, Wm. Lummis, Lucius Lyon, Charles Parsons, Charles Parsons, Jr., Edwin Parsons, George Parsons, Wm. M. White.

St. Louis, Alton & Terre Haute.—At the annual meeting of the stockholders in St. Louis, June 2, the following directors were elected: A. F. Holland, New York; Geo. W. Wall, Duquoin, Ill.; Ely Wiley, Charleston, Ill.; W. K. Murphy, Pinckneyville, Ill.; James A. Eads, Paris, Ill.; H. H. Beach, Litchfield, Ill.; Levi Davis, Alton, Ill.; Geo. W. Parker, St. Louis; Edward Abend, Belleville, Ill. The officers elected were: W. Bayard Cutting, President; Geo. W. Parker, Vice-President and General Manager; A. F. Leonard, Secretary; H. A. Crosby, New York, Assistant Secretary.

South Bend & St. Joseph.—The office of this new company is in South Bend, Ind.: the directors are J. J. Van Riper, T. S. Stanfield, J. B. Inness, G. H. Richards, A. F. Ross, E. T. Chase and J. H. Bell.

Southern Kansas.—Circulars have been issued from the general office of this road announcing the appointment of Mr. C. W. Cook as Assistant General Freight and Passenger Agent and Mr. M. K. Fleming as General Baggage Agent, both taking effect June 1.

South Pennsylvania.—The officers of this road are: President, Robert H. Sayre; Secretary, F. J. Grotevent; Directors, William H. Vanderbilt, H. F. Dimmock, H. McK. Twombley, R. Barnes, G. J. Magee, F. B. Gowen, R. K.

Sheldon, J. Duffy, D. Hostetter, Jacob Bixler and W. T. Sanger.

Sullivan County.—At the annual meeting in Concord, N. H., May 29, the following directors were elected: A. B. Harris, Springfield, Mass.; Henry C. Robinson, Hartford, Conn.; John B. Page, Rutland, Vt.; Frederick Billings, Woodstock, Vt.; John H. Albin, Concord, N. H.; Mason W. Tappan, Bradford, N. H.; Charles J. Amidon, Hinsdale, N. H. The board organized with Mr. Harris, President; Mr. Albin, Clerk; E. F. Lane, of Keene, N. H., Treasurer.

Union Pacific.—Mr. C. K. Wilber is appointed Traveling Agent for the Passenger Department of this company, in charge of District No. 12 (vice D. B. Quinlan, re-igned), with headquarters at Chicago, Ill. Appointment to take effect June 1.

United New Jersey.—At the annual meeting, May 27, the following directors were chosen: John C. Barron, Charles E. Green, John C. Stevens, Robert F. Stockton, Trenton, N. J.; A. L. Dennis, F. Walcott Jackson, Newark, N. J.; Joseph N. Bedle, Jersey City, N. J.; Wm. Bucknell, Thomas McKean, Samuel Welsh, Philadelphia; John Jacob Astor, Robert Lenox Kennedy, New York. Mr. Charles A. Butts, of Burlington, is State Director.

Wisconsin Central.—At the recent annual meeting C. L. Colby was re-elected President and E. H. Abbott Vice-President and Secretary.

PERSONAL.

—Mr. D. B. Quinlan has resigned his position as Travelling Agent of the Union Pacific road, with headquarters in Chicago.

—Don Max Sonnentern has retired from his position as Superintendent of the Nicaragua Railroad in consequence of the reorganization of the management of that road.

—Col. E. K. Sibley, formerly General Manager of the Memphis & Little Rock road, was recently presented with a very valuable silver service by a number of his friends on the road and in Little Rock.

—Mr. A. K. Mansfield, formerly Superintendent of Motive Power of the New York & New England road, has removed from Boston to Pullman, Ill., having accepted the responsible position of Assistant Manager of the Pullman Car Works.

—Mr. J. H. Bartholemew died at his residence in Derby, Conn., June 1, aged 60 years. He was for many years a well-known manufacturer, and for a long time manager of the factory of Phelps, Dodge & Co. He had been a director of the New Haven & Derby Co. since its organization, and President since 1873.

—Mr. Jermiah Millbank died suddenly at his home in New York, June 1, aged 66 years. He was well known as a merchant and banker, and leaves a considerable property. For a number of years past he has been a director and one of the largest stockholders of the Chicago, Milwaukee & St. Paul Co., and a member of the Executive Committee.

—Archibald Orme, General Ticket Agent at the Union Depot in Atlanta, Ga., shot himself through the head on June 1, inflicting a fatal injury. The cause of his suicide is not known. So far as is yet known his accounts were correct, and there was no other known cause for his action. He represented all the railroads entering the city, and had made the usual settlements for April, while those for May were not yet due.

—Mr. S. S. Merrill, General Manager of the Chicago, Milwaukee & St. Paul road has returned to Milwaukee from a three months' trip to California where he went in the hope of improving his health. Mr. Merrill is very much better than when he went away, but is not yet fully restored to health. The report that he would resign his position as General Manager in consequence of his physicial condition is denied by President Mitchell, who says that Mr. Merrill's resignation will not be accepted on any account, and that he will hold his position as long as he can be induced to, which will probably be as long as he lives.

—Mr. Samuel M. Shoemaker, of Baltimore, died at Old Point Comfort, Va., where he had gone for his health, on May 31. Mr. Shoemaker was born in 1821, and settled in Baltimore when still a young man. He joined in organizing an express line between Baltimore and Philadelphia in 1843, and subsequently was connected with Alvin Adams in the building up and organization of the Adams Express Co. For many years, and until last February (when he resigned on account of ill-health), Mr. Shoemaker was Vice-President of that company and took an active share in its management. He accumulated a large fortune, much of which was invested in railroad property. He was a director of the Northern Central, the Philadelphia, Wilmington & Baltimore, the Wilmington & Weldon, the Wilmington, Columbia & Augusta, and also of several steamship and navigation companies.

—At the meeting of the New England Railroad Club in Boston last week the following resolutions were presented by a special committee and unanimously adopted:

"*Whereas*, It has pleased the Almighty Disposer and Father of all to remove by death one who has lived a long and useful life, and has been long honored and respected by all his associates and friends; be it therefore

"*Resolved*, That the members of the New England Railroad Club, having learned with deep regret of the decease of Osgood Bradley, recognize in this event the loss of one of the oldest and best-known car builders of the country—a man of irreproachable character, unyielding integrity and warm and generous sympathies.

"*Resolved*, That we respectfully tender to the members of his family our sympathy in the great loss sustained by them.

"*Resolved*, That a copy of these resolutions be transmitted to the bereaved family, and the same be entered upon the records of this club."

TRAFFIC AND EARNINGS.

Transcontinental Association.

The Atchison, Topeka & Santa Fe Co. has given the required 90 day's notice of its withdrawal from the association. Efforts will be made to induce the company to revoke this withdrawal.

Lake Superior Iron Ore.

Shipments of iron ore from the Lake Superior region up to May 28 are reported by the Marquette *Mining Journal* as follows:

	1884.	1883.	Increase.	P.c.
From L'Anse	4,583	.....	.....	....
From Marquette	66,663	.....	.....	....
From Escanaba	279,701	.....	.....	....
From St. Ignace	6,033	.....	.....	....
Total	356,980	196,003	160,977	82.2

Of the Escanaba shipments 111,864 tons were from the Marquette District and 167,837 tons from the Menominee District. Besides the ore shipped 2,145 tons were delivered to local furnaces. Shipments of pig iron were 200 tons from Marquette.

Railroad Earnings.

Earnings for various periods are reported as below:

	1884.	1883.	Inc. or Dec.	P.c.
Five months ending May 31:				
Chi., Mil. & St. P.	$8,509,000	$8,665,757	D. $156,757	1.8
Long Island	840,106	796,593	I. 43,516	5.5
St. L. & San F.	1,785,200	1,436,800	I. 348,400	24.3
Four months ending April 30:				
N. Y. & N. Eng.	$1,034,207	$1,055,594	D. $21,327	2.0
Net earnings	164,386	40,862	I. 123,524	301.3
Shenandoah Vy.	232,763	213,803	I. 18,960	8.9
Net earnings	23,922	6,799	I. 17,123	251.8
West Jersey	312,164	276,748	I. 35,416	12.6
Net earnings	118,289	90 277	I. 28,013	31.0
Month of April:				
E. Ten., Va & G.	$291,518	$272,321	I. $19,197	7.1
Net earnings	98,171	88,578	I. 9,593	10.1
N. Y. & N. Eng.	275,507	275,891	D. 384	0.9
Net earnings	61,383	36,220	I. 25,163	69.1
Shenandoah Val.	58,538	60,677	D. 2,139	3.5
Net earnings	6,062	11,536	D. 5,474	47.4
West Jersey	93,185	76,023	I. 17,162	22.6
Net earnings	35,937	19,031	I. 16,906	89.6
Month of May:				
Chi., Mil. & St. P.	$1,986,000	$2,033,513	D. $47,513	2.3
Long Island	215,564	204,286	I. 11,278	5.5
St. L. & San Fr.	357,500	296,800	I. 60,700	20.4
Third week in May:				
Florida Ry. & N Co	$18,203	$16,438	I. $1,765	10.8
Kansas City, Ft. Scott & Gulf	41,208	30,539	I. 10,669	35.0
Kan. City, Spr. & Mem	27,644	.....	.....	....
Mil. & Northern.	10,460	9,400	I. 1,060	11.5
Wis. Central	24,339	23,636	I. 703	3.0

Weekly earnings are usually estimated in part, and are subject to correction by later statements.

Passenger Traffic Notes.

Arrangements have been completed for running through passenger and sleeping cars from St. Louis to the Virginia Springs. The cars will be run by way of the Louisville, Evansville & St. Louis and the Chesapeake & Ohio roads, beginning June 15, and will run from St. Louis to Richmond, Va., passing White Sulphur and the other springs of Virginia which are reached by the Chesapeake & Ohio.

Notice is given that the line of Pullman sleeping cars running between New York and Chicago over the New York, Lake Erie & Western, the New York, Pennsylvania & Ohio and the Pittsburgh, Fort Wayne & Chicago roads will be withdrawn from service after June 1. Until further notice through trains will continue to run over these roads as at present, making close connection at Mansfield, O., and connecting lines are desired to keep through tickets by this route on sale as heretofore, but passengers will have to change cars at Mansfield.

For the more comfortable accommodation of people who travel between Philadelphia and the seaside, the West Jersey Railroad has inaugurated the practice of reserving seats for passengers in the ordinary passenger cars. At any of the city offices of the Pennsylvania Railroad Co. and at the stations at Cape May and Atlantic City, seats may be bespoken several days in advance of a contemplated trip, and secured on the payment of a small sum above the cost of the ticket. A number of cars will be held in readiness to supply the demands of travelers.

Grain Movement.

For the week ending May 24 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	North-western receipts.	—Northwestern shipments.— Total.	By rail.	P. c. By rail.	Atlantic receipts.
1877	2,835,626	2,114,639	824,902	39.0	3,260,575
1878	6,556,985	5,045,362	2,064,690	39.7	6,847,275
1879	6,166,629	5,087,244	2,832,208	55.7	5,94 ?,849
1880	8,806,172	6,190,472	1,605,114	25.9	7,529,631
1881	5,779,755	6,047,136	1,958,493	32.4	6,735,606
1882	4,425,999	2,283,441	1,281,646	56.1	2,281,648
1883	3,509,604	4,165,226	1,422 921	34 2	4,792,863
1884	3,479,038	4,343,314	2,679,.68	61.7	2,970,380

The receipts of the Northwestern markets for the week were thus smaller than in the corresponding week of any previous year since 1877, but only a little less than last year. They were 760,000 bushels more than in the previous week of this year, and the largest since March. The increase over the previous week is at Chicago, Peoria and Duluth, and the Peoria receipts were unusually large.

The shipments of these markets were 178,000 bushels more than in the corresponding week of last year and nearly twice as great as in 1882, but smaller than in any previous year since 1877. They were 261,000 bushels less than in the previous week of this year. The real shipments, however, were larger than in any other year except 1879, when the roads were carrying for less than the present rates. The shipments down the Mississippi were 154,765 bushels, or 3½ per cent. of the whole. The lake shipments, 1,509,381 bushels, were extraordinarily small, considering the total amount of shipments. Thus for six years the lake shipments have been, in this week to May 24:

1879.	1880.	1881.	1882.	1883.	1884.
2,332,032	3,793,247	4,088,643	915,547	2,599,498	1,509,381

Only in 1882, when the total shipments were 2,060,000 bushels less than this year, were the lake shipments as small, and this is true even if we go back to 1873. It is easy to see that business must be dull with the vessels when shipments which used to be 3,000,000 and 4,000,000 bushels a week have fallen to 1,500,000.

The receipts at Atlantic ports for the week were smaller than in the corresponding week of any previous year in the table except 1882, and were 1,822,000 bushels (38 per cent.) less than last year. They were, however, 1,022,000 bushels *more* than in the previous week of this year, the largest for four weeks, and, with one exception, the largest of the year. The increase over the previous week is doubtless due to the arrival of the first canal shipments of the year at New York, 980,000 bushels of the increase being at that port, whose receipts were more than for two weeks previous.

The Philadelphia receipts were the smallest of the year, but the Baltimore receipts were large. For the three weeks previous the New York receipts had been only 46·3, 39·3, and 43 1 per cent. of the whole, respectively, but in the week to May 24 they were 61·3 per cent.

The exports from Atlantic ports in this week for five years have been:

	1880.	1881.	1882.	1883.	1884.
Flour, bbls.	118,465	116,995	120,501	136,074	134,151
Grain, bu.	5,057,306	5,370,089	1,362,358	2,845,604	1,434,544

Thus the exports this year were much less than in any other, except 1882. The grain exports have fallen off nearly one-third within two weeks, and were less this week than in any other since March.

Receipts of grain at Buffalo by lake up to May 31 were as follows, flour in barrels and grain in bushels, flour being reduced to wheat in the totals:

	1884.	1883.	Decrease.	P. c.
Flour	183,755	256,538	72,783	28.3
Grain	6,925,329	10,392,244	3,466,915	33.3
Total, bushels	7,844,104	11,674,934	3,830,830	32.8

Shipments eastward of grain received by lake were, in bushels:

	1884.	1883.	Decrease.	P. c.
By canal	4,900,189	5,597,945	697,756	12.4
By rail	1,293,852	2,819,044	1,525,192	54.1
Total	6,194,041	8,416,989	2,222,948	26.4
Per cent. by rail	26.4	33.5	7.1	...

The canal opened on the same day (May 7) in both years. The number of boats cleared from Buffalo up to May 31 was 820, against 861 last year.

Coal.

Coal tonnages for the week ending May 24 are reported as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Anthracite	492,472	483,150	I. 19,322	1.9
Eastern bituminous	198,246	173,205	I. 25,041	14.5
Coke	67,092	60,007	I. 7,085	11 8

The anthracite market continues dull, notwithstanding the reduction of the output. As previously noted, production will be stopped for 12 days in all this month, the days agreed upon by the companies being June 2, 3, 4, 5, 6, 7, 16, 17, 18, 19, 20 and 21, the first and third weeks.

The increase in bituminous is in Cumberland, Clearfield and Western Pennsylvania gas coals.

The coal tonnage of the Pennsylvania Railroad for the week ending May 24 was:

	Coal	Coke.	Total.
Line of road	144,845	57,182	202,027
From other lines	50,155	9,910	60,065
Total	195,000	67,082	262,092

The total tonnage this year to May 24 was 5,121,976 tons, against 4,745,093 tons to the corresponding date last year, an increase of 376,883 tons, or 7.9 per cent.

Cumberland shipments for the five months ending May 31 are reported by the Cumberland *Civilian* as follows:

Shipments from mines:	Tons.
Cumberland & Pennsylvania	686,201
George's Creek & Cumberland	173,912
West Virginia Central & Pittsburgh	166,528
Direct to Baltimore & Ohio	873
Total	1,027,514
Shipments out of region:	
Baltimore & Ohio R. R	766,004
Pennsylvania R. R., Bedford Division	163,573
Chesapeake & Ohio Canal	97,937
Total	1,027,514

Local deliveries are included in the Baltimore & Ohio tonnage. For the corresponding period last year the shipments were 890,124 tons, showing an increase this year of 137,389 tons, or 15.4 per cent.

Actual tonnage passing over the Huntingdon & Broad Top road for the five months ending May 31 was:

	1884.	1883.	Decrease.	P.c.
Broad Top coal	81,237	85,500	4,263	5.0
Cumberland coal	178,015	185,519	7,504	4.0
Total	259,252	271,019	11,767	4.3

The Broad Top coal is mined on the line. The Cumberland is carried through from Mt. Dallas to Huntingdon for the Pennsylvania Railroad.

Cotton.

Cotton movement for the nine months of the crop year from Sept. 1 to May 30 is stated by the *Commercial and Financial Chronicle* as follows, in bales:

Interior markets:	1883-84.	1882-83.	Inc. or Dec.	P. c.
Receipts	2,825,849	3,511,304	D. 685,455	19.5
Shipments	2,801,862	3,389,790	D. 587,537	17.4
Stock, May 30	64,174	114,679	D. 50,505	43.9
Seaports:				
Receipts	4,751,662	5,824,186	D. 1,072,524	18.4
Exports	3,529,990	4,390,815	D. 86 6,825	18.3
Stock, May 30	469,125	493,567	D. 24,442	4.9

The great bulk of the crop is now marketed and the receipts and shipments will necessarily be very light until the new crop begins to come in.

The *Chronicle* says: "In the table below we give the receipts from plantations and add to them the net overland movement to May 1, and also the takings by Southern spinners to the same date, so as to give substantially the amount of cotton now in sight.

	1883-84.	1882-83.	1881-82.	1880-81.
Receipts at the ports to May 30	4,751,662	5,824,186	4,556,889	5,565,042
Interior stocks on May 30 in excess of Sept. 1	15,018	98,194	48,160	97,632
Total rec'pts from plantations	4,766,680	5,922,380	4,605,049	5,662,674
Net overland to May 1	546,726	599,862	422,630	472,241
Southern consumption to May 1	264,000	275,000	210,000	175,000
Total in sight May 30	5,577,406	6,797,242	5,237,679	6,309,915

"It will be seen by the above that the decrease in amount in sight May 30, as compared with last year, is 1,219,836 bales, the increase as compared with 1881-82 is 339,727 bales, and the decrease from 1880-81 is 732,509 bales."

St. Louis Live Stock Shipments.

Live stock shipment from St. Louis eastward, in April, are reported as follows:

	Cars.	Head.	Per ct.
Chicago & Alton	620	13,936	12.1
Indianapolis & St. Louis	720	44,588	38.6
Ohio & Mississippi	71	5,523	4.8
Vandalia Line	681	41,011	35.5
Wabash	433	10,460	9.0
Total	2,525	115,518	100.0

Of the total shipments, 2,426 cars were from the National yards, 52 cars from the Union yards, and 47 cars from East St. Louis.

Petroleum.

The production and shipments of the Pennsylvania and New York oil wells for April are given by Stowell's *Petroleum Reporter* as follows, in barrels of 42 gallons:

	1884.	1883.	Inc. or Dec.	P. c.
Reduction	2,065,860	1,816,530	I. 249,330	13.7
Shipments	1,643,336	1,908,379	D. 265,043	13.9
Stock, April 30	36,642,794	35,789,406	I. 853,388	2.4
Producing wells	21,242	17,100	I. 4,142	24.2

The production is the largest reported for any month since November, 1882, but was exceeded in eleven months of that year and in eleven months of 1881. Of the total the Allegheny District in New York furnished 17.4 per cent., the Bradford District in Pennsylvania 55.8 per cent., the

Warren District 15.3 per cent., and the Lower District 11.5 per cent.

The shipments were the lightest since July, 1883, and were exceeded in eight months of that year and in ten months of 1882.

The stock reported is all in the pipe lines. It was increased during the month by 440,532 barrels.

During the month 298 new wells were completed, and 26 dry holes, or failures to find oil, are reported. The average production of the new wells completed during the month was 12 barrels per day each. At the close of the month there were 284 new wells in process of drilling.

Shipments for the month were as follows:

	Barrels.	Per cent. of total.
New York	668,316	40.7
Philadelphia	205,388	12.5
Baltimore	90,932	5.5
Boston	1,855	0.1
Cleveland	227,897	13.8
Pittsburgh	71,707	4.4
Down the Ohio	1,573	0.1
Local points	206,436	12.6
Refined at Creek refineries	169,292	10.3
Total	1,643,336	100.0

Shipments of oil refined at Creek refineries (reduced to its equivalent in crude) were: New York, 45,637; Philadelphia, 23,521; Baltimore, 1,892; Boston, 27,600; local points, 70,642; total, 169,292 barrels.

The *Reporter* says: "Operations during April attracted but little attention until about half way through the month, when two new wells were brought in in the Baldridge field, one starting out as a 450 barrel producer, and the other putting out 400 barrels. The latter well, which is the property of Fisher Brothers, was drilled 1,641 ft. in 21 days, and is said to have been the quickest job of the kind on record. These two wells bore down on the market for some days, but their effect was soon counteracted by the Haley well, in the same locality, which was expected to extend the belt, but which came in dry. Other wells of importance were completed during the month at Wardwell and at Wirt, Alleghany County, which attracted some attention. The chief interest of the month, however, was attracted by the developments in the new Macksburg field, which seems to be steadily increasing in importance. Several wells were completed there during the month; one, the Laing well, making over 100 barrels the first 24 hours and making the best record so far of the field."

Watermelons.

A meeting was held in Atlanta, May 29, at which there were represented the Louisville & Nashville, the Savannah, Florida & Western, the Central of Georgia, the Western & Atlantic, the Atlanta & West Point, and the East Tennessee, Virginia & Georgia. The object of the meeting was watermelons. The crop in Florida and South Georgia is expected to be very large indeed this year and the meeting was held to make arrangements for their transportation. It is stated that the crop this season will approximate 3,000 car loads, and the shipments are expected to reach that amount. The meeting was entirely harmonious and the different lines represented agreed upon the rates to be charged, and also agreed to furnish their quota respectively of fruit cars for the movement of the crop. The first shipments will be made the about June 1. The bulk of the Georgia crop is expected to go to the Northwest. That part of the crop sold in the northern seaboard states is chiefly carried by water; the rail transportation being only to the nearest seaport.

RAILROAD LAW.

Injury to Employe—Fellow Servant.

In the case of Browne against the Minneapolis & St. Louis Co., in a recent decision, the Supreme Court of Minnesota holds as follows:

1. In the absence of controlling evidence to the contrary, a station agent is presumed to have general charge of tracks and switches in and about his station and yard.

2. As respects such charge, he is the fellow servant of the corporation with an engineer who is engaged in running a locomotive upon any such tracks, and hence the corporation or common master of the two is not responsible to the engineer for injury which he may receive in consequence of any negligence of the station agent as respects such tracks.

The Missouri Statute on Killing Stock.

In the case of Kendricks against the Chicago & Alton Co., the Missouri Supreme Court holds:

1. No evidence is admissible as to whether whistling would have frightened a hog off the track. The statute required whistling, and the omission to do it was a negligence.

2. Where a hog is found dead on a crossing, and no evidence is given to show how it came to its death, or whether the railroad men whistled or rang the bell, a verdict against the company is improper.

3. An allegation that the company had wheat strewn upon its track, is surplusage and should be stricken out of a complaint for killing stock under the statute, such statute having merely contemplated the punishment of neglect to fence.

Right of Shipper to Stop Goods in Transit.

In the case of Painter against the Chicago, Burlington & Quincy Co., the Nebraska Supreme Court holds as follows:

1. The right of stoppage *in transitu* by the vendor continues until the goods have reached the buyer and the delivery is complete.

2. The right to stoppage *in transitu* is not impaired or extinguished by service of process of garnishment upon the carrier.

The fact that a common carrier has been garnisheed by a creditor of an insolvent debtor to whom property is consigned is no defense to an action of replevin by the vender who has given notice to the carrier and demanded the goods.

Demurrage and Unloading Charges.

In the case of the Chicago Lumber Co against the Burlington & Missouri River Railroad Co., the Nebraska Supreme Court holds as follows:

1. A railroad company is not entitled to charge demurrage for freight standing in its cars unless by virtue of contract or statutory law.

2. A railroad company cannot collect charges for unloading freight which it converts to its own use at the time of such unloading.

3. A railroad company, as a common carrier, cannot legally increase the charges for transportation by wrongfully diverting freight from its proper course in transit.

4 A new trial will not be ordered unless prejudicial error is shown by the record.

Liability for Accident on Leased Tracks.

In the case of Smith against the St. Louis, Keokuk & Northwestern Co., the Missouri Supreme Court holds as follows:

Where a railroad running from B. to C. desiring to connect by another railroad with A., to which the latter ran through B., made a contract with the latter to that end, the latter furnishing the motive power and crew, the former the cars and trainmen, over which between A. and B. the latter was to have entire control, and the latter to receive a percentage of all the gross earnings of the former as to transportation in which the latter road was included, the former company is not liable to a passenger injured at a station between A. and B. by the negligence of the engineer, while getting off the train made up of the former's cars and bound for its road, he having purchased transportation on the latter's road entirely, from which the former received nothing, and over which it had no control.

Speed of Trains in Cities—Municipal Ordinances.

The city of St. Paul passed an ordinance forbidding the running of railroad trains within its limits at a greater rate of speed than four miles an hour. It was objected that this ordinance was in restraint of commerce and therefore void. A suit for an injunction was brought, but the company was beaten. The case, Chicago, Milwaukee & St. Paul Railroad Co. against Mayor, etc., of St. Paul, was carried to the Supreme Court of Minnesota, where the judgment was affirmed. The Chief Justice, Gilfillan, in the opinion said: "We do not question the power of the courts to declare an ordinance of a municipal corporation void as in restraint of trade. The mere fact, however, that it operates to restrain trade will not justify such action, for proper police regulation and the judicious care for the lives and property of citizens may require such ordinance, although it interferes in some measure with the modes of transacting business. In addition to the obstruction of business there is its necessity or reasonableness as a proper police regulation. It must be apparent that to justify a court in setting aside the action of a city council its unreasonableness or want of necessity as a measure for the protection of life and property should be clear, manifest, undoubted, so as to amount not to a fair exercise but to an abuse of discretion, or mere arbitrary exercise of the power of the council. If the ordinance be unreasonable and unnecessarily oppressive to commerce, the best way to show that and to secure its modification is to obey it."

OLD AND NEW ROADS.

Anniston & Atlantic.—This road is now in full operation over the 25 miles between Anniston, Ala., and Talladega, and is doing a considerable business. Two passenger trains a day are run and large shipments of iron ore have been made. The road is laid with steel rails and the Lorenz safety switches are used. The passenger cars on this road were built by the Pullman Co. and are fitted with Westinghouse automatic air brakes and Miller platforms.

Atchison, Topeka & Santa Fe.—This company makes the following statement for April and the four months ending April 30, including the Southern Kansas lines:

	April.		Four months.	
	1884.	1883.	1884.	1883.
Earnings	$1,306,000	$1,278,154	$5,049,423	$4,792,996
Expenses	718,368	588,926	2,548,669	2,537,378
Net earnings	$587 632	$689,228	$2,500,754	$2,255,618

The mileage worked for April was 2,329 miles this year and 2,219 in 1883; for the four months, 2,306 miles this year and 2,219 miles last year. For the four months this shows an increase in gross earnings of $256,427, or 5.4 per cent.; an increase in expenses of $11,291, or 0.4 per cent., and a resulting gain of $245,136, or 10.9 per cent., in net earnings.

Boston, Concord & Montreal.—A special meeting of the stockholders of this company has been called, to be held at Plymouth, N. H., June 12, for the purpose of ratifying the lease of the line to the Boston & Lowell. The terms of the lease have not been made public and probably will not be until the meeting, but it is said that the Boston & Lowell agrees to pay 6 per cent. on the preferred stock and to pay over any surplus to the company for the purpose of making dividends on the common stock.

Boston & Lowell.—A special meeting of the stockholders has been called for June 12 for the purpose of approving leases of the Northern (New Hampshire), the Concord & Claremont, the Petersboro & Hillsboro and the Boston, Concord & Montreal roads for a term of 99 years from June 1. The terms of these leases have not been made public, but it understood that there is little doubt of their being ratified. They will then have to be submitted to the Railroad Commissioners of New Hampshire for approval.

There is, it is understood, no present prospect of a lease of the Concord road, the stockholders of that company being unwilling to go into the combination. The Boston & Lowell Co. has offered a rental equivalent to 10 per cent. on the stock, which is all the income the law will allow the stockholders, but the proposition has been declined. The lease of the upper roads, however, will place the Concord in a position entirely dependent upon the Boston & Lowell Co., and it is altogether likely that some arrangements will be concluded before long.

Central Massachusetts.—The Boston *Advertiser* of June 3 says: "It appears that there has been no lease of this road, after all. The recent running of construction trains was to collect some rails that the committee on reorganization have thought best to sell, so as to get partially reimbursed for the $50,000 or $60,000 that they are said to have advanced for the road. It is not known that any scheme is now pending for the extension or for the operation of the road."

Chicago, Rock Island & Pacific.—At the annual meeting in Chicago, in accordance with previous announcements, the Vanderbilt interest presented Mr. John Newell as a candidate for director against Mr. H. H. Porter. Mr. Vanderbilt had not, however, been successful in securing the adhesion of any large number of stockholders, for out of 397,123 shares voted on—an unusually large number—Mr. Newell received only 62,337 votes, or considerably less than one-sixth, Mr. Porter receiving 334,786, showing that the continuance of the present management is well assured.

Cleveland, Columbus, Cincinnati & Indianapolis—This company has agreed to build a branch of its road into Hamilton, O., provided the right of way is given. Much of this has already been granted. From the main line of the company's Cincinnati Division into Hamilton the distance is about five miles.

Denver & Rio Grande.—Tracklaying will soon be begun on two new branches, one from the San Juan Extension by way of Bagosa Spring and the mining camps on Alamosa and Conejos rivers to Henry on the Rio Grande. The other branch will run up Lighter Creek to coal mines recently discovered.

Erie, Rochester & Lake Ontario Terminal.—A survey has been made for this road, which is to run from the New York, Lake Erie & Western south of Rochester, crossing the Buffalo, New York & Philadelphia and the Rochester & Pittsburgh, and thence northward to Charlotte on Lake Ontario. The incorporators of the company are mostly residents of Rochester and the object of the road is to give the Erie and the Rochester & Pittsburgh an outlet to Lake Ontario for their coal business. The company proposes to build extensive docks at Charlotte where coal can be handled quickly and economically, and provision will also be made for other freights.

Flint & Pere Marquette.—This company will shortly begin work on a branch line from Genesee, Mich., westward to Flushing. It will be about 12 miles long. There is said to be coal near Flushing.

Florida Railway & Navigation Co.—Grading on the extension of this line to Tampa, Fla., is already finished as far as Panasoffkee, about 10 miles from the present terminus at Wildwood, and tracklaying will shortly be begun. Tracklaying has also been begun on the extension of the Leesburg Branch to Tavares. This branch is intended to reach some point on Indian River.

Georgia Midland.—An effort is being made to organize a company under a charter granted a few years ago. The proposed line is from Columbus, Ga., to Atlanta. The incorporators held a meeting recently and appointed a committee with authority to have a preliminary survey of the line and also to see whether arrangements can be made with any existing road for an entrance into Atlanta.

Grand Rapids & Indiana.—Surveys are being made for a branch from Elmira, Mich., by way of East Jordan and the south arm to Charlevoix. The branch will run into a considerable lumber section.

Greencastle & Southern.—This company has filed articles of incorporation to build a railroad from Greencastle, Ind., southward to Vincennes and thence to some point on the Ohio River. The line will be about 200 miles long. The office of the company is in Greencastle, Indiana.

Gulf, Colorado & Santa Fe.—It is stated that at a recent meeting of the board arrangements were completed for raising the money necessary to build the proposed extension of this road through the Indian Territory to a connection with the St. Louis & San Francisco road. Money will be raised by the sale of the remaining first-mortgage bonds of the company and some of the second-mortgage bonds which have been authorized. Most of these will be taken in Galveston. The bill authorizing the construction of the road through the Indian Territory has passed the House of Representatives and there is little doubt but that it will become a law.

Illinois Central.—On the Canton, Aberdeen & Nashville Branch of the Southern Division the track is now laid to Starkville, Miss., 55 miles east by north of the starting point at Kosciusko. The grading is very nearly finished to Aberdeen, and tracklaying is progressing steadily.

Kansas City, Arkansas & Fort Smith.—This company has filed articles of incorporation to build a railroad from Kansas City, Mo., southward to Fort Smith, Ark., a distance of about 260 miles. The capital stock is fixed at $1,500,000.

Louisville & Nashville.—Reports are current that this company is seriously embarrassed by the calling of large loans made by the late President. It is impossible to verify these at present, but it is generally accepted as a fact that the losses by Mr. Baldwin's operations were larger than has been admitted.

Mexican Central.—A meeting of the directors was held in Boston, June 1, to consider the question of the July interest payments. No action was taken, but the matter was referred to a committee. It was stated that the earnings of the road were increasing rapidly and although they are not yet sufficient to meet the interest payments, it is hoped that they will be in another year. The alternative proposed by some of the board is a request to the bondholders to fund several coupons.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of May 24:

Congress has approved the concession for a railway in Yucatan from Merida through Izamal to Sotuta.

The construction of the Acapulco, Morelos, Mexico, Irolo & Vera Cruz Railway to Vera Cruz is to begin at once, and it is expected to have the work completed within a year and a half. An important link in the line will be the Puebla & San Marcos Railway, which has been purchased by Mr. Delfin Sanchez, the papers having been signed last Thursday. The Puebla & San Marcos runs from Puebla to the station of San Marcos on the Vera Cruz line, now forming the shortest route between Puebla and Vera Cruz. The Interoceanic line, which is now built to Calpulalpam, with a branch to La Luz, will at once be built from the latter point to a connection with the San Marcos line at Vireyes, giving, within two or three months, a new line from this city (Mexico) to Puebla in competition with the Mexican Railway. The line will then be pushed on to San Juan de los Llanos and thence to Vera Cruz by way of Perote and Jalapa. A more direct connection will be afforded between this city and Puebla by the building of a line from Calpulalpam to that city by way of San Martin Texmelucan, possibly absorbing the present Puebla & San Martin Railway; if not, building an independent line all the way. The company will thus have two separate lines a part of the way to Vera Cruz, one by way of San Martin, Puebla and San Marcos, and the other going direct by San Juan de los Llanos. The Mexican Railway will have severe competition from the Interoceanic at its four most important points,—Mexico, Vera Cruz, Puebla and Jalapa,—leaving the former in undisputed possession of only Orizaba and Cordoba. The Interoceanic has contracted for 20,000 tons of steel rails, sufficient to build over 500 kilometers of track. The contract at first was for only 10,000, but the order has been doubled. Rolling-stock has also been contracted for to the amount of 430 cars and 25 locomotives. Of the cars, 40 are passenger, and the rest freight; 150 will be forwarded at once.

Missouri Railroads.—The following statistics of railroad lines in Missouri are taken from the forthcoming report of the Railroad Commissioner on the business of 1883: Number of miles of railroads, 4,615; number of miles built in 1883, 114; gross amount of stock issued, $117,766,238; average per mile of road, $26,429; gross amount of mortgage bonds, $106,958,557; average per mile of road, $24,106; gross amounts of stock and bonds, $224,724,795; average per mile of road, $50,535; gross transportation earnings, $28,754,335; average per mile of road operated, $6,343; gross operating and general expenses, $18,126,911; average per mile of road, $3 996; total net earnings, $10,627,424; average per mile, $2,347. Rates of expenses to earnings 63 per cent.; total interest charges per annum (about), $6,500,000; total surplus earnings, after paying expenses and interest, $4,127,424.

Montana & Dakota.—This company has filed articles of incorporation to build a railroad from Miles City, Mon., by way of Fort Benton, Fort Beaufort, and Bingham to Deadwood, Dak. The capital stock is fixed at $1,500,000.

Nashua & Lowell.—At the annual meeting held last week resolutions were passed requesting the directors of the company, in view of the fact that the recent discord between

the Boston & Lowell and the Concord companies tends to the prejudice of this road, to do what they can to promote harmony, and to procure the organization of a single consolidated railroad running from Boston as far as Concord at least and if possible further.

New York, Lake Erie & Western.—The Bradford (Pa.) *Evening Star* says: "A new railroad, 12 miles in length, is being built from Bradford along the west branch of the Tunungwant River, to accommodate Hoyt Bros., tanners, who have an extensive tannery and large hemlock lands in that region. The road has been graded for 20 years and will be finished by July 1. Twenty-eight or 30 bridges and trestles will be required on the line. A large force of men are now at work. The road is really a continuation of the Erie switch."

New York & Long Branch.—The bearing of the suit to restrain the Philadelphia & Reading and the New Jersey Central companies from excluding the Pennsylvania Railroad Co. from this road was to have been had in Philadelphia June 3. It was, however, postponed in consequence of a compromise agreement which has been entered into between the companies, and will probably be withdrawn altogether. Full particulars of the new agreement have not been published, but by it the pooling contract is altogether abolished and hereafter each company will do what business it can secure over the Long Branch road. It provides that each company shall run as many trains as it shall deem necessary over the road, the only condition being that the same rates shall be charged and that the annual payment of $206,000 to the New York & Long Branch Co. is to be guaranteed. The accounts from the beginning will be settled under the provisions of the new contract, that is on the basis of the business actually done and not under the old pooling agreement. The new arrangement will probably lead to a considerable increase of train service during the season.

New York & New England.—The Receiver's statements give the following figures for April and the four months ending April 30:

	April.		Four months.	
	1884.	1883.	1884.	1883.
Earnings.....	$275,507	$275,801	$1,034,267	$1,055,594
Expenses.....	214,124	239,671	869,881	1,014,732
Net earnings	$61,383	$36,230	$164,386	$40,862
Per c. of exps.	77.7	86.1	84.1	96.1

For the four months this shows a decrease of $21,327, or 2.0 per cent., in gross earnings, with a decrease of $144,851, or 15.2 per cent., in expenses, and a resulting gain in net earnings of $123,524, or 301.3 per cent.

Judge Shipman has issued an order to the effect that the Receiver may be amenable to the Railroad Commissioners in regard to the proposed new union depot at New Britain, provided he does not expend more than $15,000 without the express approval of the Court.

New York, West Shore & Buffalo.—A suit has been begun by Walter S. Stokes, a stockholder of the North River Construction Co., in the New York Supreme Court, asking that a new receiver be appointed for that company in place of Mr. Green, and also that an injunction be issued to prevent the completion of the proposed settlement between the North River Co. and the West Shore Co. by the acceptance of second mortgage bonds in payment of the balances due on construction. The Court has granted the usual order to show cause why the relief asked for should not be granted.

Norfolk & Virginia Beach.—This railroad is now completed and will shortly be opened for traffic. It extends from Norfolk, Va., eastward to a point on the ocean beach a few miles south of Cape Henry. It is 17 miles long and runs over almost perfectly level country, there being but two slight excavations on the entire line. From Broad Creek to the beach, a distance of 14 miles, the road is entirely straight. The only expensive work has been a few trestles near Norfolk. For most of the distance the road passes through a country which has either already been cut up into truck farms or is capable of being used for that purpose. The road is of 3 ft. gauge and has 3 engines, 12 passenger cars and a number of freight cars. The beach at the terminus of the road is said to be one of the finest in the country. It runs north and south in nearly a straight line; it is hard and level, and extends along the shore for 40 miles. At the beach terminus the company has built a pavilion for excursionists and a large hotel, and has made arrangements to meet all the usual demands for a summer resort.

Northern (New Hampshire).—A special meeting of the stockholders of this company is to be called probably some time in June, for the purpose of acting on the proposed lease of the road to the Boston & Lowell Co. It is now admitted that a lease has been practically agreed upon, subject, of course, to the approval of the stockholders. The date of the meeting has not yet been announced.

Northern Pacific.—It is stated that contracts will shortly be let for a section of 25 miles of the Cascade Division running from Tacoma, Wash. T., eastward towards Green River and Stampede Pass.

The extension of the Jamestown & Northern branch as now opened for business runs from Carrington, Dak., northward 18 miles to New Rockford, and the grading of this extension is completed to Minniewaukon at the west end of Devil's Lake, about 30 miles from New Rockford in a northerly direction. Track has been laid for four miles north of New Rockford on this grade. The line from Carrington to Devil's Lake varies but little from an air line. From Carrington westward a branch locally known as the Mouse River road is in operation west 13 miles to Sykeston. The object of this branch is said to be to reach the Mouse River region, although the further extension beyond Sykeston has not been definitely located. The track on both of these branches was laid in the fall of 1883, but they were not turned over at that time to the operating department, although occasional trains were run by the construction department, until the middle of November when operations were suspended for the winter. Both branches are now in full operation by the company.

Ohio River.—This road is now completed and will be formally opened for business June 10, on which date the contractors, Coolman & Paige, will turn the road over to the company. The road runs from Parkersburg, W. Va., up the west side of the Ohio River, following the river very closely, to Benwood, four miles south of Wheeling, a distance of 90 miles. At Benwood it connects with the extension of the Pittsburgh, Wheeling & Kentucky road, over which trains will run into Wheeling. While the road is an independent line, not owned by the Pennsylvania Company, trains will be run in connection with those on the Pittsburgh, Wheeling & Kentucky, completing a through line from Pittsburgh to Parkersburg. The opening of the road will be celebrated by an excursion, to which a large number of guests have been invited, including prominent business men of all the towns along the road. The road was to have been completed some three months ago, but the floods in the Ohio River early in the spring caused extensive damage to the work, the repair of which has occupied the additional time.

Old Orchard Junction.—This road it is said will soon be sold at public sale. It is a short line extending from Old Orchard station on the Boston & Maine road to Old Orchard Beach, Me. It was built entirely for summer traffic, but last year was not operated. It is said that Portland parties expect to buy the property and extend the line up the Saco River Valley to Buxton, on the Portland & Rochester road.

Philadelphia & Reading.—In Philadelphia, June 2, an application was made to the United States Circuit Court by Henry C. Kelsey for the appointment of receivers for this road. The Court promptly granted the application and appointed three receivers, Edwin M. Lewis, Stephen A. Caldwell and George de B. Keim. These are the same persons who held the office in the former receivership, except that Mr. Keim, President of the company, takes the place of Mr. Gowen.

The interest on the consolidated mortgage bonds, amounting to $607,475, was not paid by the company, but notice was given that Messrs. Drexel & Co., of Philadelphia, would purchase the coupons, and most of them were accordingly presented to that firm and paid by them, they retaining the coupons. Payment by Drexel & Co. was made on the authority of a cable dispatch from J. S. Morgan & Co., of London, and it was generally supposed that Mr. Vanderbilt advanced the money, being anxious to protect his large holding in the property. The interest upon the income mortgage bonds, amounting to $55,890, was not paid. The June dividend on the New Jersey Central stock was paid by the company, showing that there is evidently no intention of defaulting upon the lease if it can possibly be kept in force.

Some anxiety having been expressed as to the position of the wages scrip recently issued by the company, special reference is made to the notes in the following circular which has been issued by the Receivers:

"The undersigned have this day taken possession of the property and effects of the Philadelphia & Reading Railroad Co. and the Philadelphia & Reading Coal & Iron Co. as Receivers of said corporations, appointed by an order of the Circuit Court of the United States for the Eastern District of Pennsylvania.

"The business of both companies will be conducted by the Receivers, and all officers, agents and employés of both companies will be continued in their respective positions.

"The wages certificates heretofore issued by the railroad company, and the obligations for supplies, materials and labor issued in May by both companies, will be redeemed at maturity by the Receivers out of the income of the properties.

"All overdue wages of both companies not yet settled for by wages certificates will be paid in cash, due notice being given of the times and places of payment."

From the terms of the circular it will be seen that no more scrip will be issued for the present.

President Keim issues the following brief circular to the stockholders:

"I think it is due to all interested in the securities of the company to say that no apprehension should be felt in consequence of the appointment of Receivers, the company having cheerfully acquiesced in the application for a receivership, believing it a wise and prudent measure for the protection of every one owning either the stock or bonds of the company."

The receivership was inevitable, and the company has probably taken the wisest possible course in not trying to put it off any longer. In fact it is evident to all disinterested persons that the former receivership never should have been terminated, and that it was probably done entirely for the effect on the securities and in order to remove objections to the New Jersey Central lease. The company was not then and has never since been in any condition to stand alone. What the issue of the present receivership may be is at present uncertain, but it is apparent that there can be no permanent reorganization of the company a large reduction in the debt, which can only be secured through foreclosure.

The report that the June coupons on the consolidated bonds had been bought up for the account of W. H. Vanderbilt is contradicted by Messrs. Drexel & Co., who say that the purchase of the coupons is entirely in pursuance of an arrangement between themselves and the company. As far as can be learned, the coupons were bought and will be held by a syndicate in which Drexel & Co. take one-half and Mr. John Lowber Welsh the other. It is also reported that the syndicate, in agreeing to buy the coupons, made the condition that Mr. Gowen should have nothing to do with the finances of the company hereafter.

Portland & Ogdensburg.—A dispatch from Portsmouth, N. H., June 4, says: "There was a hearing this morning in the United States Circuit Court upon the motion of Gen. S. J. Anderson, Receiver of the Portland & Ogdensburg Railroad for an enlargement of the former decree, constituting him Receiver, with certain powers. By the former decree he was authorized to issue receiver's certificates of indebtedness to the amount of $150,000, which should be a first lien on the road. The object was to enable the road to be put in a suitable condition for business. The original application asked for authority to issue certificates for $250,000, but the amount was limited to $150,000. This, the Receiver says, is entirely insufficient, hence his motion to so enlarge the original decree that he may issue additional certificates to the amount of $100,000. The Mercantile Trust Co., of New York, as the holder of $80,000 second-mortgage bonds, on which no interest has been paid since 1876, opposed the original motion and also the present one. The Trust Co. says the New Hampshire division was unjustly discriminated against in the application of the net earnings and in making repairs, and asks that the motion be denied. Decision reserved."

Pottsville & Mahanoy.—In Pottsville, June 2, the Court rendered a decision continuing or making perpetual the injunction obtained by this company against the Philadelphia & Reading Railroad Co. This is the last of the pending injunction cases against the Reading, and the result of all these suits gives the new road full liberty to build upon the line which it located into Pottsville.

Quincy, Effingham & Eastern.—An effort is being made to raise money along the line of this projected road, which is to run from Quincy, Ill., by way of Shelbyville to Effingham. The project has been laying dormant for a long time.

Shenandoah Valley.—The statement of earnings and expenses for April and four months ending April 31 is as follows:

	April.		Four months.	
	1884.	1883.	1884.	1883.
Gross earnings.....	$58,538	$90,677	$232,763	$213,803
Expenses.....	52,475	49,140	208,841	207,004
Net earnings.....	$6,062	$11,536	$23,922	$6,799
Per cent. of expenses	89.7	80.9	89.7	96.8

This shows for the four months an increase of $18,960 or 8.9 per cent., in gross earnings, with an increase of $1,887 or 0.9 per cent. in expenses, and a consequent gain in net earnings of $17,123 or 251.8 per cent.

South Bend & St. Joseph.—This company has been organized to build a railroad from South Bend, Ind., northwest to the Michigan State line, a distance of eight miles. It is to be an extension of the St. Joseph Valley Railroad, of Michigan.

Spartanburg & Rutherford.—A contract for building this road has been let to a Boston concern known as the Southern Railroad Construction Co. This company is to receive $125,000 in county and town bonds, the balance payable in stock and bonds of the railroad company. The road is to run from Gaffney City, S. C., on the Atlanta & Charlotte Air Line, northwest 30 miles to Rutherfordton, N. C., and is a link in the projected air line from Charleston to Chicago.

Texas & Pacific.—The June interest on the Eastern Division consolidated bonds was not paid by this company, but the coupons were paid, or bought, by the Missouri Pacific Co., that company retaining possession of them. The officers of the company say that this has been done before, but it is commonly reported that this course has been taken in order to give the Missouri Pacific a first lien on the property, and to pave the way to a foreclosure and the complete transfer of the road to the Missouri Pacific under a reorganization.

Wabash, St. Louis & Pacific.—Default was made June 2 on the interest then due on the Indianapolis Division bonds, the Havana Division bonds and the general mortgage bonds. The whole amount of the coupons thus defaulted on is $556,300.

A St. Louis dispatch says: "The office of the Receivers will be in this city. There will be no changes among officials and employés and the operation of the road will go on as usual for the present. Under the receivership the divisions which are earning their interest charges will be compelled by the courts to pay them. There will be no permanent default on the obligations of the Toledo, Chicago and Kansas City divisions. The interest of the non-paying branches, however, will be defaulted and the original owners allowed the alternative either of funding their coupons or taking back their property. It is declared impossible at present to state what divisions will be left out of the new organization, with the exception of the Cairo & Vincennes; no doubt that line will have to go."

The following circular in regard to the receivership has been issued by the board of directors:

"The St. Louis, Iron Mountain & Southern Railway Co. has notified this company that the net earnings of the Wabash lines operated under the lease of April 10, 1883, are insufficient to pay the interest and other fixed charges, and that, as the lessee company, it will no longer advance for the deficiency.

"In consequence of this notice, and of the large decrease in the net earnings of this company, arising partly from the failure of the crops in the past two years, and partly from the severe competition at low rates, it has become necessary to ask the holders of the general mortgage bonds, as also the holders of the bonds on the several lines that have not earned their interest, to co-operate in a plan of relief which will not only place the company in a sound financial condition, but will, it is believed, restore confidence in the value of all its securities.

"In pursuance of this plan, the holders of the general mortgage, Indianapolis Division and Havana Division bonds are now asked to surrender the coupons due June 1, and accept in exchange income bond scrip, entitled to 6 per cent. interest from the net earnings of the company in excess of its fixed charges, and convertible into bonds in sums of $1,000. The coupons thus surrendered to be held in trust to secure the ultimate payment of the income bonds.

"The other bonds, the coupons of which it may be necessary to fund in like manner, the company is at present unable to designate, but due notice will be given to the holders thereof.

"It is clear that the interest of the holders of all these securities, the fixed charges of which are not at present earned on their respective lines, is to unite in such an equitable arrangement as will permit the operation of the entire system without embarrassment.

"This can only be accomplished by the forbearance and intelligent co-operation of these bondholders. Under no circumstances or conditions can they expect more than the entire net earnings of the lines covered by their bonds, and these it is proposed to apply rigidly and fairly to the protection of every interest in its respective order of priority, providing also for the safety of all the interests by the gradual extinction of the floating debt, which controls a large share of the rolling stock and other property essential to the traffic operations of the company.

"The Wabash system is composed of more than 53 original companies, in all about 3,600 miles, in six continuous states, having in all 38 separate mortgages, in view of all which, and in order to secure an equitable adjustment between these various interests, it is apparent that no plan can be carried out without the intervention and protection of the United States courts. It has, therefore, become necessary to apply for a receiver who can thus be enabled to hold and operate the property in its entirety until measures of permanent relief can be perfected.

"During the past two years this company has suffered very seriously from the ruinously low rates on a large portion of its traffic. A small advance in these rates would change a deficiency in its fixed charges to a surplus for its stockholders, and it is hoped that the time has come for a better understanding between all competitive lines, to the end that more remunerative rates may be obtained."

The Court has authorized the Receivers to protect notes of the company falling due in June to the amount of about $310,000, and also all other secured notes of the company until further orders.

Western, of Alabama.—This road will shortly add to its equipment several heavy mogul freight engines the purchase of which has been made necessary by the increased traffic over the road.

West Jersey.—This company's statement for April and the four months ending April 30, is as follows:

	April.		Four months.	
	1884.	1883.	1884.	1883.
Earnings.....	$93,185	$76,023	$312,164	$276,748
Expenses.....	57,248	56,992	193,875	186,471
Net earnings.....	$35,937	$19,031	$118,289	$90,277
Per cent. of exps....	61.6	75.0	62.4	67.3

For the four months this shows an increase of $35,416, or 12.6 per cent., in gross earnings, with an increase of $7,404, or 4.0 per cent., in expenses, and a resulting gain in net earnings of $28,012, or 31.1 per cent. The increase of earnings in the first four months of this year is greater than in any previous year for the same period. This is owing chiefly to the growth of the manufacturing industries along the lines of the several branches, each branch showing increased earnings during the past month. The recent strikes at and closing of glass manufactories in the western part of Pennsylvania have materially aided the similar industries in New Jersey.